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Factors Behind Inapt Performance of Entrepreneurs in Rural Income Generating Activities: A Survey of Selected Rural Premises in Tanzania.

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Abstract: *this paper presents a discussion on factors behind inapt performance of entrepreneurs in Tanzanian rural IGAs, as its main objective; with specific focus on the shared psychological, anthropological and sociological factors liable for inapt performance of entrepreneurs in rural IGAs and their associated impacts. The study was a survey in nature employing qualitative approach in data presentation and analysis. The multistage sampling as well as Krejcie & Morgan model were the triangulated sampling methods employed in obtaining 92 respondent from the population of study. The data were descriptively presented in tables. The study observed the following as the shared factors influencing the performance entrepreneurs in rural IGAs with varied degrees: psychological factors (dearth of N-achievement, external locus of control, abject risk taking, inadequate tolerance for failure, and impaired innovation streak) by 53.3 percent in average; anthropological factors (strong social norms, impaired business ethics, destructive rural spiritual beliefs, biased interests to IGAs, and bent of attitudes to work) by 55.4 percent in average; as well as, sociological factors (unfavorable rural development policies, poor rural incomes, poor rural social networking, poor technology adoption, and unfavorable milieu; which are in, political, economic, social, technology, and ecological dynamics respectively) by 57.6 percent in average. It was the researcher's belief that, if the objectives are justly met, rural planners will have reliable inputs for IGAs policies revamps in enriching better recital of entrepreneurs. Scholars will have the ready source of literature.*

Key Words: Performance, Rural, IGAs, Tanzania.

Background to the study

The development of Income Generating Activities (IGAs)¹ seem to be an accepted global wisdom with nations aspiring to transform their nations from agricultural to industrial economic states than it could be noticed before and soon after independence era. The debates for rural IGAs development agenda is almost from all platforms of the development agitators, especially in less developed countries; even though practical results differ from activists' rhetoric.

Whilst rural IGAs picking up as the development agenda, entrepreneurship as a global economic driver has never been behind in attracting attentions of many scholars in the view of how it can be used as a tool for managing the competing economic resources in the facet of rural global population lapse (Sedláček, 2017). Entrepreneurship has been viewed as a pool for job creation, innovation tool, and economic resilience vehicle among the global dwellers (Carletto, 2007 & Dias, 2019).

Whilst tracing its background, literatures depict entrepreneurship, as a discipline, to have passed through distinct periods of human life; each of which having differed business interfaces. With the early periods; past agricultural revolution era (12,000 BC), the trade rout era (around 2000 BC), medieval era (around 1470), and, mercantile era (around 1550-1800); there were many global trade changes, marked by exchanges of goods for goods, that then witnessed merchant-adventures selling goods for merchants by retaining certain rated profit for their labor (McClelland, 1967 & Sedláček, 2017). In 17th century, the global trades called economists to have a closer look at entrepreneurs undertakings; following their greater contributions to the economies of states and their differentiated approaches to venture opportunities. Such economists as Richard Cantelona viewed an entrepreneur as a risk taker, buying commodities in a known price and expecting to sell it at unknown price (Simpeh, 2014). The 18th century witnessed Whitney Eli differentiating an entrepreneur from venture capitalist (McClelland, 1967). In 19th and 20th centuries, entrepreneurs were not distinguished from managers (Simpeh, 2014 & Sedláček, 2017). While entrepreneurs seen as economic men who managed enterprises for personal gains (Chepurenko, 2015); Morgan labelled entrepreneurs as inventors and innovators (Simpeh, 2014). Since then, there has been a number of entrepreneurial support programs in terms of capacity building, natural bases strengthening, financial inclusion, social networking and policies revamp, amid many others in rural (Parker, 2009 & OECD, 2019).

However, mapping entrepreneurship development in the view of rural IGAs' performance; it appears that, Tanzania government began its first major attempt to promote entrepreneurial initiatives

¹Income-generating activities (IGAs): are those initiatives that affect the economic aspects of people's lives through the use of economic tools such as credit

through small industries sector as far back as 1966 year (Chongela, 2015) with the formation of the National Small Industries Corporation (NSIC) under the National Development Corporation (NDC) (URT, 2018). The major emphasis of the NSIC was to establish small industrial clusters while conducting training on production, marketing and distribution skills to entrepreneurs; the role of which was later vested to the Small Industries Development Corporation (SIDO) in 1973 (Chongela, 2015 &URT, 2018).

Despite its good roles in IGAs development, SIDO has been experiencing a number of challenges resulting to little impacts than expected on capacity building to rural entrepreneurs for their better performance in IGAs. Some of the said defies include; inadequate budgets; fewer qualified staff; and, inapt strategic repositioning (URT, 2018). Nevertheless, beside these managerial challenges; development partners, donors and NGOs have over the years influenced many institutional reforms by creating regulatory framework, developing sectoral policies, and institutional capacity building for rural IGAs recital (OECD, 2019). Grassroots skills training and micro-finance programmes for rural entrepreneurs' capacity building have been too implemented (Nerman, 2015 & URT, 2018). Despite these initiatives, the failure rate of rural IGAs in Tanzania commercial industry has never reflected the promising future to the said entrepreneurial rural IGAs partakers.

Statement of the problem.

Of the total number of entrepreneurs' rural IGAs started in a year, more than 78 percent die in their first and second years of set-up (Pindado, 2017). Despite the allied stakeholders' initiatives in developing rural premises, the recital of entrepreneurs in Tanzanian rural IGAs is still trivial compared to those in urban. Many studies have been done on the influence of psychological, anthropological and sociological domains to entrepreneurial perspectives (Nerman, 2015 & Pindado, 2017), but, no study has been done on the shared psychological, anthropological and sociological dynamics behind the said inapt performance of entrepreneurs in Tanzanian rural IGAs. Therefore, the designed study was worth undertaken to uncover the shared factors influencing this inapt entrepreneur's performance; with detailed observations on the magnitudes of impacts each of the attributed factor contributes to the inapt recital of the said IGAs partakers.

Study Objective

The overall objective of the proposed study was to examine the factors behind inapt performance of entrepreneurs in Tanzanian rural IGAs. And the specific objectives of this proposed study were: to examine the shared psychological factors influencing the performance of entrepreneurs in rural IGAs; to examine the shared sociological factors influencing the performance of entrepreneurs in rural IGAs; and, to examine shared anthropological factors influencing the performance entrepreneurs in rural IGAs. If the objectives are justly met, rural planners will have the reliable inputs in revamping IGAs' policies for better entrepreneurs' performance. Scholars will too have the ready source of literature.

Literature Review

The literature presents a number of theories and concepts on entrepreneurial IGAs' allied issues in both theoretical and empirical parts for review. The survey below, portrays the chosen

issues for review amidst many literatures of the time for the study in question.

Theoretical aspects of the study

The study adheres to three clusters of entrepreneurial theoretical perspectives, namely; psychological theories; sociological theories; and, anthropological theories. Psychological theories are theories highlighting personal characteristics that define individual's entrepreneurial streak (Simpeh, 2014 & Pindado, 2017). *Personality Traits*; which is one of psychological theories provides that, there are enduring inborn qualities or potentials in an individual that naturally make him an entrepreneur (Kerr, 2017). Personality traits drive an entrepreneur to see a cup half full rather than half empty. Likewise, Locus of control theory (under the same psychological theories) focuses on the belief about whether the outcomes of our actions are contingent on what we do or on events outside our personal control (Lefcourt, 2014; Kerr, 2017 & Pindado, 2017). Individuals with internal locus of control believe that they are able to control life events, while those with external locus of control believe that life's events are the result of external factors, such as chance, luck or fate (Baum, 2014 & Lefcourt, 2014). Moreover, *Need for Achievement*, probably the most famous psychological theory *stated* by McClelland provides that, a human being has a need to succeed, accomplish, excel or achieve (McClelland, 1967). There exist evidences for the relationship between achievement motivation and entrepreneurship (Baum, 2014 & Simpeh, 2014). Venture risk taking, tolerance for ambiguity, need for achievement, and innovativeness as psychological aspects have positive and significant influence on one's entrepreneurial inclinations (McClelland, 1967 & Pindado, 2017). Though, locus of control bears negative influence on entrepreneurial streak; it seems to be strongly correlated to such traits as; risk taking, need for achievement, and tolerance for ambiguity. Findings also indicate that, aversion to risk declines as wealth rises (Simpeh, 2014).

Sociological theories are theories for which the level of analysis is the traditional societal context (Baum, 2014 & Simpeh, 2014) including social networks. This advocates that, entrepreneur should not take unwarranted advantage of people to be successful; rather, success should come as a result of keeping faith with the people. Analyzing the life situations and characteristics of individuals who have decided to become entrepreneurs can influence people's thought and action to do something meaningful with their lives (Baum, 2014 & Pindado, 2017). Again, one's sociological background is one of the decisive "push" factors to become an entrepreneur. Moreover, with the theory of population ecology; such environmental factors as, political, technology, and social-economic system (including: legislation, customers, and competition) play a vital role in the survival of the venture or the success of the entrepreneur (Simpeh, 2014 & Pindado, 2017).

Anthropological theories are theories focusing on the study of the origin, development, and culture (customs, and beliefs) of a community (Baum, 2014 & Simpeh, 2014). For an individual to be successful in a venture, then, societal cultural contexts should be considered. With a view of entrepreneurship model, new ventures are created by the influence of one's culture (Pindado, 2017). Cultural practices lead to varied entrepreneurial attitudes

such as innovation; that also lead to venture creation behavior (Simpeh, 2014). Individual ethnicity affects attitude and behavior; and culture reflects particular ethnic, social, economic, ecological, and political complexities in individuals (Baum, 2014 & Kerr, 2017). Thus, cultural environments can produce attitude differences as well as differences in entrepreneurial behavior.

The Performance of Rural IGAs in Tanzania for Growth

Studies indicate that, there are more IGAs to rural economies than just farming (Onyebu, 2016 & Bekele, 2019). Rural premises are described by a great range of economic activities, including; tourism, mining, public services, products processing, marketing of agricultural products, and other diversified merchandizing interventions (Chongela, 2015 & Onyebu, 2016). Rural IGAs are said to constitute to about three third of the global population. Although rural dwellers are defined to be agrarians depending on agriculture for making livelihood; about 20 to 50 percent of rural population from Latin America, Asia, and Africa are employed in non-farm activities (Carletto, 2007 & Bekele, 2019). The entire rural IGAs contributes to a total of 16.6 current global GDP, which is expected to be 17.7 unleashed GDP with 15.2 GDP as its baseline screen by 2030 (Bekele, 2019). In Tanzania alone, rural IGAs contributes more than a third to the total growth in GDP; while employing more than 70 percent of Tanzanians and more than 100 percent of domestic food supply (URT, 2018). Looking on rural agriculture alone, it can be seen that the sector employs about 87.6 percent of rural residents with about 69.4 of the total household incomes generated (URT, 2018 & OECD, 2019). Despite its absorption of the greater proportion of Tanzanian (65.5 percent), the sector contributes lesser (29 percent) to total nation GDP than it could be expected (Fox, 2018 & URT, 2018).

Rural Entrepreneurial IGAs Related Areas for Redress

Some of the key areas of rural entrepreneurial IGAs related programs considered important for redress would include: market and marketing infrastructure; entrepreneurial capacity building; loans accessibility; transportation network; job creation (Nerman, 2015; Dana, 2018; Bekele, 2019 & Dias, 2019); as well as small business and micro enterprises development (Dana, 2018).

In market and marketing infrastructures, for example, installation of reliable infrastructures for markets and marketing information system (advertisement, promotion, and distribution units) is crucial; as these limit rural IGAs products suave-flow (HubSpot, 2019). According to Kotler, commodities are sold; not bought (Kotler, 2011). On the other hands, entrepreneurial capacity building in both hard and soft skills to Rural IGAs is inevitable (Chongela, 2015). Specific skills trainings, improving serving capacity, enhancing resources accessibility (including financial credit), and production skills to rural IGAs operators are important for rural growths (Nerman, 2015). The group lending model used by most of microfinance institutions need to be reviewed as it inhibit entrepreneurs' innovations (Dana, 2018). If the named are equitably addressed, IGAs players will be enhanced to compete effectively in diverse industries of their venture investments.

Besides recent initiatives made by Tanzania government in rural infrastructural reforms, many rural premises are yet to be well networked as most of road are seasonal, if not poorly maintained

(Deloitte, 2016). This limits the smooth flow of rural products to where they are desired. If rural networks were well channeled, the income gap between rural and urban would be un-complained minimal, and IGAs players would not be laden by such witnessed unwarranted bull of poverty (Nerman, 2015 & Bekele, 2019).

On the other hand, protecting the value of marginal productivity of rural labour has been a difficulty affair. Rural niches have been the price taking segments of the operating market structure; where labour force payment to the said large population of Tanzanians is economically inefficient (Nerman, 2015 & Deloitte, 2016). Rural settings have been descriptively regarded as habitats for paupers; where educated and well-off individuals can never stay (Bekele, 2019). Hence, in ensuring the sustainability of the said population segment, much should be done by policy makers and practitioners in refining the value of marginal productivity of agro-labors. Micro financing institutions in rural need to balance their role as the pro-poor vessel and as the profit making machineries. This should go in hand with helping rural micro-enterprises in diversifying agriculture with non-agricultural ventures through credits provision; while considering both as parts of rural IGAs with significant impacts to GDP and GNP in any state.

In General, entrepreneurs in rural IGAs are confronted with unique snags ranging from political, economic, social, technological, ecological to legal domains, including; adverse ecological distress, inadequate capitals for investments, sectoral rivalry, limited venture experiences and heavy IGAs statutory compliance (Dias, 2019 & OECD, 2019). Other constraints include; unfavorable working premises, limited access to finances, high credit interests, dependence on a limited number of people, close contacts to customers and business partners, as well as simple structures, pressure for short-term success, high bond with businesses, stable cultures and high commitments (Sedláček, 2017 & Dana, 2018).

Opportunities Available for Strengthening IGAs in Tanzania

Despite the number of challenges portrayed above, IGAs operators are said to have a multitude of openings which when aptly utilized, the observed inefficiency can be all by-gones. Some of the major opportunities available in Tanzania for IGAs promotion includes: government support through grants and subsidies, as well as financial credits from banks and SACCOS (Chongela, 2015 & URT, 2018). Business incubators for grooming entrepreneurs; as well as community based organizations for unifying local communities' initiatives; and, the ready markets for goods produced are some of other openings available (Fox, 2018).

However, studies indicate that, many entrepreneurs in rural IGAs never utilize the readily available opportunities in optimizing their operational results for growth (Dana, 2018). Some of unutilized opportunities include; various on-going reforms in structure and policies for rural economic growths by the government, and the strengthened IGAs services providers such as SIDO, Vocational Education Training Authority (VETA), micro-financing institutions (depository and non-depository), and other varied industrial supporting agencies (Deloitte, 2016 & URT, 2018)

Research Gap

Psychological theories suggest the existence of stable qualities that a person shows in most of the situations. Sociological theories explain how human interaction with environmental influences ones' entrepreneurial success. And, anthropological theories provides how, human origin, culture and development effects ones entrepreneurial characters. But, no study has been done to ascertain the shared psychological, anthropological and sociological factors behind inapt recital of entrepreneurs in Tanzanian rural IGAs, and their linked magnitudes of impacts to the said rural IGAs' operators; the realism of which is sought.

Conceptual framework

The study considers few variables in three bands for analysis, amid many others, namely: psychological factors (N-achievement, locus of control, opportunity orientations, risk taking, tolerance for failure); sociological dynamics (political, economic, social, technology, and ecological environments); and, anthropologic factors (social norms; ethics; belief; interests; attitudes).

Figure 1: Conceptual framework



Source: Researchers own construct

Research Methodology

The study was qualitative in approach; with a single overall objective aimed to examine the factors behind inapt performance of entrepreneurs in Tanzanian rural IGAs. A survey study design was conducted in the selected rural premises of five chosen Tanzania's regions (namely; Mara, Morogoro, Mbeya, Kigoma, and, Kilimanjaro); which were considered appropriate to enhance an apt determination of shared factors behind inapt performance of entrepreneurs in rural IGAs. A survey is the research design used to collect information from relatively large number of cases or units of inquiry under investigations (Kothari, 2003 & Kumar, 2011). The selection of rural premises in the said regions for the study was done based on the reasons of; geo-polarity inclusions; and large human populations with differed ethnic groups, diverse cultures and occupations. The target population was IGAs' partakers; for which a sample of 92 respondents was extracted from the total of 120 identified IGAs players by the use of Krejcie & Morgan sampling model (Krejcie, 1970); after a thorough multistage sampling done to identify respondents from the said regions of Tanzania for which a complete list of all members of entrepreneurs population does not exist and is inappropriate. The research schedules and documentary reviews were used to collect the data; for which frequencies and percentages were presented in tables. Using non-parametric measures, entrepreneur's recital in rural IGAs; as a dependent variable; as well as entrepreneur's psychological traits, anthropological factors, and sociological dynamics; as independent variables were assessed. Data analysis and presentation were done descriptively by using excel software. Descriptive statistics such as; frequencies, percentages and means

were presented in tables for the study analyses and generalization of factors behind inapt entrepreneurs recital in rural IGAs while; abiding to ethical research issues (Kumar, 2011 & Kothari, 2003).

Findings and Discussion

This section presents findings and discussions on factors behind inapt performance of entrepreneurs in Tanzanian rural IGAs; built on three pre-determined specific study objectives. The analyzed data were presented in frequency and percentage tables for the study generalization, conclusion making and commendation.

Demographic characteristics of the population of study

The study results in table 1 below indicate that, the population of study had a large number (47.8 percent) of people aged in between 26 to 50 years, most (54.3 percent) of whom are women. The large proportions (84.8 percent) of this population lived in rural. However, a small proportion (13 percent) of the said population had dual residences for active search of life necessities. Roman Catholic and Muslims were their major denominations with the total population shares of 36.9 and 28.7 percent respectively. The population of study had a large proportion of primary and secondary school people (45.6 percent and 28.3 percent respectively). While, 65.2 percent of the residents being self-employed; and, 06.5 percent unemployed; 28.3 percent of them were civil servant and NGOs employees (see table 1 results).

Table 1: Demographic Characters of Rural IGAs Payers

Parameters	Frequency	Percent
Age group		
01-25	19	20.7
26-50	44	47.8
51-75	24	26.1
76 +	05	05.4
Total	92	100.0
Sex of the identified respondents		
Male	42	45.7
Female	50	54.3
Total	92	100
Residency		
Rural residence	78	84.8
Urban residence	02	02.2
Dual residence(Urban Rural)	12	13.0
Total	92	100.0
Religion		
Roman Catholic	34	36.9
Muslims	08	28.7
Lutheran	11	10.0
Seventh Day Adventist	22	05.9
Others	17	18.5
Total	92	100.0
Education level of respondents		
Non-formal education	16	17.4
Primary Education	42	45.6
Secondary Education	26	28.3
College	08	08.7
Total	92	100.0
Unemployed	06	06.5
Self-employed	60	65.2
Civil servants & NGO's employees	26	28.3
Total	92	100.0

Source: source

After satisfactory analysis of the research findings in table 1; the study directed the researcher to generalize that, the population of study has energetic work force due to the presence of large proportion of people aged in between 26 to 50 years. And that, the greater proportion of women in rural IGAs than men denoted their active involvement in economic production role; besides the two renowned reproduction and community service role in the set of triple gender roles (Onyebu, 2016 & World Bank Group, 2019). With the cumulative 91.3 percent of non-college IGAs partaking entrepreneurs in the study, it could denote the blurred community future, as the said economic agents are not well equipped with apt skill for fair competition in the global free market economy. This reflects to the populations' rejections in labor markets; as it seems be for 71.7 percent of non-civil servant and NGOs individuals, who are unemployed in formal sectors, not because of their desire, but because of their unemployable skills. These findings concur with those of OECD and Fox, L (Fox, 2018 & OECD, 2019).

Distribution of Labour in the Surveyed population of study

As from the field statistics in table 2, about 78.2 percent of unemployed individuals were dependents to their relatives; most of the self-employed (48.9 percent) were engaged in agricultural related ventures (crop cultivation and animal husbandry); while those employed being mainly absorbed in the ministry of education (38 percent) and in local governments (17.4 percent).

Table 2: Different Occupations of Population of Study

Parameters	Frequency	Percent
The way unemployed manage lives		
Depending on relatives	72	78.2
Bagging	02	02.2
Supported by NGOs	02	02.2
Others	16	17.4
Total	92	100.0
Sector in which individuals are self-employment		
Crop cultivation	25	27.2
Animal Husbandry	20	21.7
Food vender	05	05.4
Pet trading	14	15.2
Shop keepers	03	03.3
Dry cereal and vegetables selling	13	14.2
Others	12	13.0
Total	92	100.0
Employers of the employees		
Ministry of education	35	38.0
Local government authorities	16	17.4
Ministry of Community Development	10	10.9
Ministry of health	06	06.5
Ministry of Agriculture	10	10.9
Others	15	16.3
Total	92	100.0

Source: Survey data, 2019

With table 2 results from the field, the government's distancing from intervening rural unemployment issues to about 71.7 percent of the population's workforce denotes the call for immediate revamp of unemployment policies by stakeholders. On the other hand, the prevalence of about 56.3 percent of partakers in agro-

ventures would signify the need for authentic entrepreneurial skills training in the sector as it affect the majority of rural lives. The poor performance of non-agricultural ventures (food vender, pet trading, merchandizing and others) may be associated to the press of community priority for food production as the psychological need. Moreover, the plenty of employees from the ministry of education (38 percent) in this study reveals their abundance in rural as opposed to other civil servant. And, the overall presence of differed public and private sector employees in IGAs partaking could signify inadequate pay they receive from their employers; for which they add-on by engaging in the allied IGAs within their areas. Unluckily, their labour-duality are likely to mark inefficacy in the production possibility frontier scaling (Deloitte, 2016).

Entrepreneurial skills provided to Rural Entrepreneurs

The field result in table 3 revealed that, the majority (55.4 Percent) of rural IGAs' entrepreneurs are unaware of agencies supporting their ventures; while the remaining 44.6 percent knows them. Either, there was only 28.3 percent of the respondents admitting that, entrepreneurial skills are offered to IGAs operators; while 09.8 percent being unaware, and the majority (61.9 percent) affirming the said skills to be not provided. Moreover, the majority (45.6 percent) of respondents said to have accessed information on entrepreneurial skills through peoples' story telling; followed by newspaper and radio ads with 19.6 and 15.2 percent respectively. Nevertheless, the said IGAs partakers held that, entrepreneurial skills offered are greatly based on; crop cultivation, animal husbandry and preservation skills with 34.8 percent 26 percent and 13 percent respectively. Negotiation and market related skills with 09.8 percent and 06.5 percent seem to be rarely offered.

Table 3: Entrepreneurial Skills Offered to Rural IGAs Players

Parameters	Frequency	Percent
Responses on whether IGAs entrepreneurs knows firms supporting undertakings in their areas		
Yes	41	44.6
No	51	55.4
Total	92	100.0
Response on whether Entrepreneurial skills are provided IGAs operators		
Yes	26	28.3
No	57	09.8
Unaware	09	61.9
Total	92	100.0
The way people got to know the said entrepreneurial skills related information		
Through Radio	14	15.2
Through News paper	18	19.6
Through peoples' story	42	45.6
I saw them working	10	10.9
Through public meetings	08	08.7
Total	92	100.0
Category of entrepreneurial and consultancy skills provided		
Crop cultivation	32	34.8
Negotiation skills	07	09.8
Animal husbandry skills	24	26.0
Preservation skills	12	13.0
Marketing related skills	06	06.5
Others	11	11.9
Total	92	100.0

Source: Survey data, 2019

With the majority (61.9 percent) of IGAs’ partakers admitting that they are unaware of agencies supporting their ventures, and that, only a few (28.3 percent) declaring entrepreneurial skills to be provided; it could be judgmental to say, the poor performance of rural IGAs is the result of inapt entrepreneurial skills offered to rural IGAs’ operators. The avowals that, entrepreneurial information has been accessed through hear saying, newspapers and radio (with cumulative 81.2 percent) is an indication that, rural IGAs’ segment has not been adequately aligned to the ever promoted industrial sector in Tanzania. Hence much need to be done by policy implementers in bringing the development balance between urban and rural enterprising community segments.

Nevertheless, the study results indicated that, the given entrepreneurial skills, if at all available; are mainly biased to the production part of the entire agro-business chain, while living aside the distribution and consumption patterns. Issues of preservations are given low priority (12.5 percent); while studies indicate the great risks in agro-chain arises out of perishability domains of agro-products (Bekele, 2019). The provision of derisory marketing related skills (06.5 percent), is an affirming prove that, many rural IGAs-venturesome fail to realize their

expected outcome due to poor marketing skills offered to them. And, even if they take their IGAs products to markets, they never get the deserved value out of their produces, because of lack of negotiation skills; as though the study results depict a small rate (09.6 percent) of accessibility for the same. The finding for this inefficient negotiation and marketing skill offered to rural entrepreneurs correspond to that of Dana’s study (Dana, 2018).

Psychological Factors Influencing the Performance of Entrepreneurs in Rural IGAs

Using five point Likert scale, table 4 presents responses on whether entrepreneurs in rural IGAs endow such identified success factors as; need for achievement, locus of control, risk taking, tolerance for failure, and innovation streak or not. The field result shows the average retorts for strongly agree (SA); Agree (A); undecided (U), disagree (D) and strongly disagree (SA) were: 19.5 percent; 25.0 percent; 02.2 percent; 28.3 percent; and, 25.0 percent respectively. However, during analysis, **agree /strongly agree** were merged to mark the response **agree**; while **disagree /strongly disagree** being merged to mean **disagree** response.

Table 4: Psychological Factors Influencing the Performance of Entrepreneurs in Rural IGAs.

S/N	Likert Item	Frequencies (freq) and Percentage (perc) Proportion of Responses for:-									
		SA		A		U		D		SD	
		Freq	Perc	Freq	perc	Freq	Perc	freq	Perc	Freq	Perc
1	Rural IGAs operators portrays high need for achievement (N-achievement) in their undertakings	19	20.7	23	25.0	00	00.0	27	29.3	23	25.0
2	Rural IGAs operators are driven by internal locus of control in whatever rout they take to venture decision.	16	17.4	23	25.0	04	04.3	26	28.3	23	25.0
3	Rural IGAs players are stirred risk-taking venturesome	20	21.7	21	22.8	00	00	27	29.4	24	26.1
4	Rural IGAs operators are endowed with innovation streak in overcoming differed venture dynamics	14	15.2	20	21.7	01	01.1	30	32.6	27	29.4
5	Rural IGAs operators are tolerant for failure in the facet of venture uphill and ambiguities	21	22.8	28	30.4	05	05.4	20	21.7	18	19.6
Average percent score		18	19.5	23	25.0	02	02.2	26	28.3	23	25.0

Source: Survey data, 2019

As from table 4, the study results indicate only (45.7 percent) of the respondents agreeing that, entrepreneurs in rural IGAs are motivated by their N-achievement; while the cumulative majority (54.3 percent) disagree on the claim. The low drive for N-achievement could be explained to the axiom that, the majority of rural population are constantly striving to meet the primary psychological needs (Pindado, 2017) with less motive for changes as they find no successful entrepreneurs in their areas to act as their reference groups. Therefore, such motivation model as valence expectancy framework (McClelland, 1967 & Miner, 2015) should necessarily be employed to revive the hopes of failure hearted entrepreneurs in rural by arousing the said dead N-achievement.

With majority’s disagree responses (53.3percent) in table 4, it appears that, most of entrepreneurs in IGAs are not driven by their internal locus of control; contrary to minority individuals (42.4 percent) agreeing with the avowal. This implies that, rural entrepreneurs’ belief is vested on the concept that, their failures have been the result of adverse external environments, and with the same maxim, they cannot get out of their inapt IGAs recital

unless they are freed by external agent(s). It is now worth to assert that, rural IGAs’ inapt performance has been the result of too much entrepreneurs’ belief that the government and other change agencies will deliver them from their pressing felt needs. Too much reliance on governments is the shared defy facing citizens in most of African state (Fox, 2018 & World Bank Group, 2019). This suggest that, rural IGAs and pro-entrepreneurship agencies need to expose the said venture partakers to different cases of successful tycoons in arousing their dead success desires resulted from monomers failures of their reference groups in rural settings.

Furthermore, from the same field results in table 4, the greater majority of respondents (55.5 percent) disagree that rural IGAs entrepreneurs are risk takers; as opposed to their relative minority proportion (44.5 percent) agreeing with the claim. Though what seem to be lucky appears when preparation meet opportunity, no seed have ever germinated in the premise it was never thrown. Individuals fail to excel in their plans as they fail to take their carrier risks (Pindado, 2017). With this view, the larger majority of rural entrepreneurs need to review their venture in-going

models; as their failures can be the results of laggard behaviors in comprehending venture opportunities they exhibit.

On the other hand, while assessing the levels of tolerance for failure, the study results indicated that, a large proportion of respondents (53.2 percent) admits that, entrepreneurs in rural IGAs are tolerant for failure in the facet of venture uphill and ambiguities as they spare their rating on agree retorts; while others (41.3 percent) disagree to affirm the alleged tolerance of rural IGAs partakers to venture ups-and-downs in the facets of dares. As most of rural entrepreneurs invest on agro-projects, the common challenge to them is normally ecological distress (Chongela, 2015). Therefore, the majority (mainly agrarians) of population's claims to be tolerant to diverse ecological weathers is not because they are willing to do so; rather, it is because they have no option for making their lives apart from farming.

Nevertheless, most of respondents (62 percent) disagree that rural IGAs operators are endowed with creativity and innovation streaks in overcoming differed venture dynamics; as opposed to minority (36.9 percent) of the said segment of study population. According to, Chepureno, a successful entrepreneur is the one who confronts the universe with new idea turned into marketable products (Chepureno, 2015). That is to say, rural IGAs' partakers fail to come up with innovates as they perceive the universe to be all identical to what it used to be. This calls for absorption of rural

IGAs partakers in entrepreneurial incubators and see how they can effectively build their capacities in the view of identifying and converting the global challenges to venture opportunities

Section conclusion: though the attribute of tolerance for failure seem to be in favor of entrepreneurs recital in rural IGAs by 53.2 percent, the overall result indicated that, inapt performance of entrepreneurs in rural IGAs is influenced by lack of such psychological factors (traits) as; need for achievement (N-achievement), internal locus of control, risk taking ability, tolerance for failure in the facet of ambiguities and lack of innovation streaks by 53.3 percent in average.

Anthropologic Factors Influencing the Performance of Entrepreneurs in Rural IGAs

The study findings in table 5 presents responses on whether: rural norms; venture ethics; rural community beliefs; individuals' interests; and, entrepreneurs' attitudes to IGAs are associated to the observed inapt performance of entrepreneurs in rural IGAs or not. With five point Likert scale, the average retorts for: strongly agree (SA); Agree (A); undecided (U), disagree (D) and strongly disagree (SD) were recorded to be: 25.0 percent; 30.4 percent; 01.1 percent; 25.0 percent; and 18.5 percent respectively. However, during analysis, **agree /strongly agree** were merged to mark the response **agree**; while **disagree/strongly disagree** being merged to mark **disagree** responses.

Table 5: Anthropological Factors Influencing the Performance of Entrepreneurs in Rural IGAs

S/N	Likert Item	Frequencies (freq) and Percentage (perc) Proportion of Responses for:-									
		SA		A		U		D		SD	
		Freq	Perc	Freq	Perc	Freq	Perc	freq	Perc	Freq	Perc
1	Rural community norms are major stumbling stone for IGAs adoption to new operational culture in their venture	23	25.0	25	27.2	02	02.2	22	23.9	20	21.7
2	Rural IGAs fall under proprietors' domains of interest	22	23.9	29	31.5	00	00.0	26	28.3	15	16.3
3	Rural spiritual beliefs restrict entrepreneurs to initiate IGAs bound to the violation of the stated values	20	21.7	24	26.1	02	02.2	26	28.3	20	21.7
4	The failures of rural IGAs are strongly attached to their inapt adherence to venture ethics especially financial management	28	30.4	32	34.8	01	01.1	17	18.5	14	15.2
5	Rural communities are of the attitude that, agricultural related IGAs are designated to uneducated fellow	23	25.0	30	32.6	02	02.2	22	23.9	15	16.3
Average percent		23	25.0	28	30.4	01	01.1	23	25.0	17	18.5

Source: field survey, 2019

The study result in table 5 above provides that, the majority (52.2 percent) against the minority (45.6 percent) of respondents agree that, entrepreneurs in rural IGAs fail to adopt new operational cultures in their ventures as they are bound by strong community norms. As though also revealed by Onyebu, rural communities fail adopt new technologies for positive changes as they embrace tradition working culture in which labor distribution is all biased to gender (Onyebu, 2016). With the said gender bias (as in table 1 on sex distribution), the greater burden of triple gender role (reproduction, economic production and community serving roles) is rendered to women, low IGAs' productivity, and the observed rural gender inequalities; as though also explained by World bank (World Bank Group, 2019). The situation suggests the empowerment of the voiceless women section in rural societies with apt skills of analyzing, identifying and acting to break the set of cultural related chains undermining their public right.

Again, from table 5 above, the study result indicates the large proportion of respondents (55.4 percent) agreeing that, rural IGAs normally fall out of entrepreneurs domain of interests. It is only 44.6 percent of respondents affirming (agreeing) rural IGAs to be in line with the said entrepreneurs' domains of interests. This implies that, the large number of entrepreneurs in rural IGAs undertake the said ventures for non-optional life serving purpose; but, not due to their drives of inner passions. Since interest driven undertakings yield more positive results than circumstantial driven ventures (Miner, 2015); the inapt performance of entrepreneurs in rural IGAs faces no escape from the virtue of denied partakers' interests. Therefore, the result based initiatives need to be installed in rural mega-project to stimulate the interests of young arising entrepreneurs; especially, in sectors employing the majority of rural population (agro-sector). This will enhance the said entrepreneurs to perceive agriculture as an equal paying undertaking as other high rated jobs in their communities.

On assessing the impact rural spiritual beliefs, the majority (50 percent) of respondents disagree that, spiritual beliefs in rural restrict entrepreneurs to initiate IGAs bound to violate the stated values. However, their relative fellows (47.8 percent) who agreed with the avowal should not be neglected. Many Christian inclined entrepreneurs miss the opportunities that Muslim dominated states could open if there were no spiritual attached embargos to them; in the same way Muslim inclined venturesome do in Christian dominated states. The spiritual bound beliefs to consumers' culture have detrimental impacts on what a consumer purchase; on what a producer yields; and, on what a supplier offers to the market (Kotler, 2011). As from the study result, rural entrepreneurs may be producing what consumers are bound not to buy; while consumers in rural aspiring what entrepreneurs cannot produce due to the prevailing cultural beliefs in their rural localities. Therefore, in installing rural IGAs, entrepreneurs need to have a thorough study on consumers belief related culture to avoid the missile-less IGAs defeat in a plenty of venture biased bystanders.

However, from the study finding in table 5, it appears that, the large proportion of respondents (65.2 percent) against the minority (33.7 percent) agreed that, failure of rural IGAs are strongly attached to their inapt adherence to venture ethics, especially in financial management area. Many entrepreneurs never adhere to "a separate entity accounting principle"; as they make their personal drawings beyond IGAs level of outputs (Nerman, 2015). This infers that, rural IGAs entrepreneurs fail to show positive venture growths' portfolio as their input output ratio deteriorates beyond their respective industrial vulnerability levels due to non-adherence to financial management ethics. This call for financial management skills and overall business ethics to be installed among rural entrepreneurs in evading unexpected IGAs failures.

Nevertheless, the majority (57.6 percent) of respondent agree that, the rural communities are of the attitude that, agricultural related IGAs are designated to uneducated fellow; while the minority (40

percent) of the surveyed population disagreeing with the opinion. The view of the majority concurs with that of Chongela on challenges of agro-sector (Chongela, 2015). With this skewed attitude to majority, the multitude of learned individuals gets circled out of the major rural production intervention (agriculture); contrary to what the universe could expect their academic skills be reflected in the said most population employing sector. This call for policy makers to review rural agricultural polies in a view of making agribusiness the more paying intervention that anyone should aspire to venture in rather than avoiding to engage in.

Section conclusion: though the attribute of spiritual beliefs seems not to restrict rural entrepreneurs' initiation of some IGAs with incompatibility to consumers values by 50 percent, the overall results indicated that; the poor performance of entrepreneurs in rural IGAs is influenced by such anthropologic factors as: strong social norms; lack of financial management ethics; strong rural spiritual beliefs; impaired entrepreneurs' interests to IGAs; and, bent entrepreneurs' attitudes to IGAs by 55.4 percent in average.

Sociological Factors Influencing the Performance of Entrepreneurs in Rural IGAs.

Table 6 presents findings on whether such sociological attributed variables (factors) as; rural development policies, consumers incomes; social networking; rural technology; and natural environments (which are perceived sociological dynamics in; political; economic; social; technology; and, ecological domains respectively), influence entrepreneurs' performance in rural IGAs or not. Table 6 indicates that, the average responses for strongly agree (SA); Agree (A); undecided (U), disagree (D) and strongly disagree (SA) to the identified variables of analysis were; 18.5 percent; 22.8 percent; 01.1 percent; 30.4 percent; and 27.2 percent respectively. During analysis, **agree/strongly agree** were merged to mark the response **agree**; while **disagree/strongly disagree** being merged to mark **disagree** responses.

Table 6: Sociological Factors Influencing the Performance of Entrepreneurs in Rural IGAs.

S/N	Likert Item	Frequencies (freq) and Percentage (perc) Proportion of Responses for;									
		SA		A		U		D		SD	
		Freq	Perc	freq	Perc	Freq	perc	Freq	Perc	Freq	Perc
1	Rural development policies for IGAs are in favor of entrepreneurs operations	23	25.0	25	27.2	01	01.1	23	25.0	20	21.7
2	Rural IGAs entrepreneurs record high sales for their outputs as rural economies are branded by high incomes customers	16	17.4	23	25.0	00	00.0	28	30.4	25	27.2
3	Rural output are of high contribution to GDP as rural IGAs are heavily favored by environmental friendliness	14	15.2	20	21.7	01	01.1	30	32.6	27	29.4
4	Rural IGAs has high market access for their products sales as they endow strong absorptions culture to new technologies	20	21.7	21	22.8	00	00.0	27	29.4	24	26.1
5	Rural IGAs get higher returns for less of their investments as they embrace exemplary venture skills and social networking	14	15.2	17	18.5	01	01.1	32	34.8	28	30.4
Average percent score		17	18.5	21	22.8	01	01.1	28	30.4	25	27.2

Source: field survey, 2019

As from the study findings in table 6, rural development policies for IGAs are in favor of entrepreneurs operations as the majority (52.2 percent) of respondents rated it with agree retorts. Though the majority perceive polices to be in favor of rural IGAs, the remaining 41.7 percent disagreeing segment with the avowal need not to be belittled. This is because, having a good policy and amply

implementing it are two separate affairs. A good unimplemented policy varies not with its sole absence (Dias, 2019).

Policy makers need to seek the minority's idea in finding out the joint issues for redress in protecting the shared public interests.

The study results in table 6 also denote that, minority of respondents (42.4 percent) agree that, rural IGAs entrepreneurs record high sales for their outputs as rural economies are branded by high incomes customers; while majority (52.2 percent) of the said population of study disagreeing with the affirmation. Studies indicate that, rural outputs faces low demand rates; despite their compelling need within their production points (Jayadatta, 2017). As inadequate income reduces purchasing power of an individual; rural dwellers are thirst of the needed commodities in the midst of plenty commodity basket bundles for their lives. Hence, inapt performance of entrepreneurs in rural IGAs can never be separated from the bull of poverty hampering their target customers within their local surrounding. This implies that, rural business are not going because of undid desire for them, but because of consumers' income poverty. Therefore, addressing huddles on entrepreneurs' inapt performance for rural IGAs growth should go in hand with the revamp of the available poverty relief policies in rural settings.

Similarly, the majority (62 percent) of respondents, as in table 6 disagree that, rural output are of high contribution to GDP as rural IGAs are heavily favored by environmental friendliness; while the minority (36.7 percent) perceiving the avowal positively (agree). Considering that, the greater proportion of rural dweller are agrarians with less contributions to national GDP (URT, 2018), and on the majority's view, it could be worth asserting that, inapt performance of rural IGAs is closely associated to unbearable ecological distress. About 72 percent of nation GDP is contributed to by only about 18 percent of the non-agrarian Tanzanians (Fox, 2018), while the greater agrarian majority (85 percent) adding to growth only about 27 percent of the said national GDP. This calls for immediate agro-mechanizations and remolding of collective pathway for rural products' value chains in optimizing rural outputs from what the ecological settings offer as opportunity.

Moreover, considering technological influence on entrepreneurs' performance in rural IGAs, the majority of respondents (55.5 percent) disagreed with the assertion that, rural IGAs entrepreneurs have high market access for their products sales as they endow strong absorption culture to new technologies; with the minority (44.5 percent) agreeing on the statement. Though the differences of the portrayed results is not much big, there are reasonable evident that rural communities are still hanging on their strong traditional values, in the views that, some technologies (especially social media) are cultural destructive (HubSpot, 2019). Products marketed through such social media as, Instagram; Facebook, Twitter and others of the like, hardly get accessed by aged people, strong traditionalists or deep religious inclined persons; as pictures and other commercials displayed in them are perceive immoral with respect to their ascribed values (Baum, 2014 & HubSpot, 2019). The results imply that, most of rural IGAs produces record inadequate sales in markets; not because they not needed, but because they are inappropriately marketed. Therefore, the choice of marketing technological-driven tool by an entrepreneur in rural should consider customers attitude on it; as the wrong choice for it can be more of liability than being an asset.

Nonetheless, the avowal that, entrepreneurs in rural IGAs get higher returns for less of their investments as they embrace

exemplary venture skills and social networking seem to be ironic to majority of respondents (65.2 percent) as they disagree with the axiom; against the minority (33.7 percent) agreeing with it. Under the free global market economy, no single business can make it without a well-established network. Contrary to what it used to be during the production marketing philosophy era, under the current social marketing philosophy, theories provide that, commodities are sold; not bought (Kotler, 2011). Despite having good products and a well-established networks, marketing skills are important in identifying, communicating and offering the desired products to differed niches of unsatisfied consumers (HubSpot, 2019). The rejection of the said avowal in this study is an indication that, entrepreneurs in many rural IGAs never get higher returns for less of their total investment; not because their products are not needed in the market, but because they are adversely marketed by poor networked entrepreneurs. Therefore, in addressing inapt performance of entrepreneurs in rural IGAs, incorporating networking and marketing strategies in agency's plan is inevitable.

Section conclusion: from the study result, it appears that rural IGAs growth policies are in favor of entrepreneurs operations by 52.2 percent. However, the overall results indicated that; amid the favorable rural growth policies, such sociological linked factors as; poor consumers incomes; poor social networks; poor rural technological adoptions; and adverse natural environments (which are in; political; economic; social; technology; and, ecological domains respectively) collectively influence entrepreneurs' performance in rural IGAs by 57.6 percent in average.

Study Conclusion and Recommendation

The purpose of this study was to examine the factors behind inapt performance of entrepreneurs in Tanzanian rural IGAs. While focusing on psychological, anthropologic, and social domains; the study observed the following shared factors to influence the performance of entrepreneurs in rural IGAs with varied degrees: psychological factors (dearth of N-achievement, external locus of control, abject risk taking, inadequate tolerance for failure in facet of ambiguities, lack of innovation streak among rural entrepreneurs) by 53.3 percent in average; anthropologic factors (strong social norms; impaired business ethics; destructive rural spiritual beliefs; individual's biased interests; individuals' bent of attitudes to work) by 55.4 percent in average; as well as, sociological factors (unfavorable rural growth policies, poor rural incomes, poor rural social networking, poor rural technology adoptions, and hostile natural environments; which are in, political, economic, social, technology, and, natural ecological dynamics respectively) by 57.6 percent in average. The study findings directed a researcher to assert that, the nature of entrepreneur, type of the venture (IGA) and background of an entrepreneur has a detrimental impact to what differentiate rural and urban entrepreneur's output and outcome in an IGA of his/her choice. Therefore, it is recommended that, in addressing inapt performance of entrepreneurs in Tanzanian rural IGAs, the responsible authorities not only need to focus on physical infrastructures, but also, incorporating the identified; psychological, anthropological and sociological attributes in their long term strategic plan. The same study need to be done in some communities in Europe, Asia and America for results comparison.

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Political Advertising On Mass Media Construction

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Abstract- Today, television as one of the rapidly growing broadcast media in Indonesia. Every day the audience get great exposure information from the mass media. In addition to conventional advertising are political advertising that is a magnet that affect television viewers. The number of party competition in elections, such as the 1999 election, which led to many of the contending parties and attract public attention. Ahead of Presidential Election 2014, several national leaders to run for the post of presidential candidate Susilo Bambang Yudhoyono replace. Parties showed elektabilitasnya to show figures that will be in the stretcher leader in the presidential election of 2014, one of the National Mandate Party. Based on the above, we propose the research problem, namely, How political advertising Hatta Rajasa meaning with jargon "Populist PAN, accomplishing Amanah Rakyat"? What are the signs and markers were constructed in political advertising Hatta Rajasa with jargon "Populist PAN, accomplishing Amanah Rakyat"? This study used a qualitative research approach. Researchers also used the technique of data analysis in this study using semiotic analysis. And using semiotic analysis of Charles Sanders Pierce. From the discussion above may be concluded that the main image of the image berlapisnya political institutions (PAN) Advertising MAPAN to encourage young people become young entrepreneurs, young people will MAPAN with joint PAN. PAN defended the people with the reality series advertisements, by Hatta Rajasa imaging (Chairman of the PAN) defending traditional markets and supports young people to become young entrepreneurs. Described problems with young children there is no job, the problems of young people willing to venture businesses are confused about what, young children do not have a problem of capital, problems of young people are afraid to lose, and the problems of young people willing to venture but do not understand how that disampai through these ads

Index Terms- Advertising, Construction image, semiotics, politics

I. PRELIMINARY

Ahead of the 2014 elections much media coverage as one of the rapidly growing broadcast media in Indonesia. One competing in the market are Metro TV, RCTI, MMC TV joined the PT. Citra Media Nusa Purnama (accessed www.mediaindonesia.com on November 18, 2013) Case. Every day viewers (audience) get the exposure of information is so great, even Al Ries and Jack Trout giving the term the situation with overcommunicated society (Al Ries and Jack Trout, 2002: 8). Information in the form of messages in newspapers, books, magazines, radio, television, CDs, movies, newspapers, events

Sponsorships (Selu Margaretha Kushendrawati, 2011: 11). Laymen refer to as an ad.

Advertising is the structure and composed nonpersonal communication of information, usually paid for and usually persuasive in nature, about products (good, service and ideas) by identified sponsors through various media (William F. Arens, 2002: 7). (Ads are not personalized messages to deliver information in a structured and arranged, on a product, goods, services, or ideas that are paid by the sponsor in the know, through various media). In political communication the most important component that is the message to be conveyed through media ads served by television. Political advertising can be done in various media, mass media, electronic or print media, such as newspapers, magazines, radio, television and billboards. Through political ads can describe what will be done by political party candidates. As well utilized as publicity to inform the vision and mission, the work program launched by political party candidates.

The number of political party competition in elections, such as the 1999 elections, causing many competing political parties and public attention. Many become the dominant ideologies that emerged in 1999, except for communism. There are nine political parties for election campaigns in 1999 include PAN (National Mandate Party), PPP (United Development Party), PDI-P (Indonesian Democratic Party of Struggle), PDKB (Democratic Party Love the Nation), the United Nations (PBB), PK (Partai Keadilan), Golkar (Golkar Party), PKB (National Awakening Party), PFM (Justice and Unity Party) (Ibnu Hamad, 2004: 92).

In addition, before the presidential election of 2014, several national leaders ran as President replacing Susilo Bambang Yudhoyono (SBY). Parties showed elektabilitasnya by presenting the leading personalities who will advance in the presidential election of 2014. One of the National Mandate Party which nominated her identity to get ahead or compete into the General Election of President and Vice President in 2014, Hatta Rajasa, who is ready to be nominated in Presidential Candidates 2014 by the National Mandate Party (PAN). PAN Hatta optimistic chose to fight against its competitors on the choice of president in 2014. The existence of the National Mandate Party strategy to win Hatta Rajasa in the 2014 Presidential Election National Mandate Party politics to establish communication with various groups of political parties. Besides nationalist parties, PAN to establish communication with the Islamic-based parties. But the coalition is determined in the platform to solve the problem in Indonesia (accessed on Coverage 6.com (11/28/2012), on December 3, 2012 at 00:18).

Hatta Rajasa is a DPP chairman of the National Mandate Party (PAN). Wherein Basic Principles of a movement or Hatta

Rajasa can be seen from the platform of the Party, namely the morality of religion based politics that bring Mercy to all the worlds. Platform as an identity, as well as the nature of the mission and vision of the National Mandate Party movement. In the platform of the identity of the National Mandate Party that PAN is a political party that makes religion as the foundation of moral and ethical state and nation that respects human dignity and pluralism in the fight for people's sovereignty, social justice and the life of the nation is better to make Indonesia as a nation prosperous, advanced, independent and dignified. Vision or concept that is owned by Hatta Rajasa form of PAN can perform activities that touch people's needs. Not only populist political activities but also meet people's problems and provide solutions.

Political advertising exposure Candidate Presidential Election 2014, many done by the political parties for publicity itself in nomination, among other political parties that pass the verification KPU (General Election Commission) is the National Mandate Party (PAN), the Indonesian Democratic Party of Struggle (PDI P), the Democratic Party, Gerindra, Group Party (Golkar), People's Conscience Party (Hanura), the Prosperous Justice Party (PKS), the National Awakening Party (PKB), the United Development Party (PPP), the National Democratic Party (Nasdem) (accessed on www.kompas.com, on January 13, 2013, at 18:35).

The number of political parties competing ads on television. Advertising on television is political advertising much sociological foster the spirit of social interaction in the community. One of them is the National Mandate Party political advertising that carries Hatta Rajasa as a Presidential Candidate in 2014 through political advertising entrepreneur-ESTABLISHED (Forward Together PAN). MAPAN political advertising is a program implemented by Hatta Rajasa as Chairman of the PAN are real (real) and measurable success for MAPAN Hatta Rajasa is a program that provides concrete solutions not just a political campaign promises. Hatta Rajasa MAPAN is a program that can be accessed by the people of Aceh to Irian Jaya community, as well as a program Hatta Rajasa MAPAN symbiotic with poverty alleviation because it teaches participants (young people) to be independent and stand alone with young entrepreneurship. MAPAN program are required to revive the economy of Indonesia today and peeps Genari generation of young people are resilient in managing the economic system of their respective regions.

Their reforestation Indonesian economic system can generate an entrepreneurial spirit or the concepts of movement of young people in managing the economic system. Impact to annihilate pengaguran, poverty became complexion problems of the economic system of a country. Issues and dynamics above become reality today. Their exposure to television media on political advertising as well as their political ads Hatta Rajasa that aired in various media television SCTV, RCTI, Trans TV, etc. It makes the curiosity of researchers for much more in researching the meaning or message hidden from jargonya "PAN populist, accomplishing Amanah Rakyat "either through dialogue or political ad impressions mark in this Hatta Rajasa.

II. LITERATURE REVIEW

CONSTRUCTION CONCEPT OF SOCIAL MEDIA

Social construction, a television ad text or visual discourse of knowledge disseminated via television and watched by the public (Bungin, 2008: 38). Watched television ad impressions Kalisambung but their construction process of creation of television ads to viewers. Social Konstruksi on reality is slow, time-consuming, is the spatial and hierarchical-vertical take place. Where the social construction lasted from leaders to subordinates, led to mass, etc., contain social consciousness shape reality to the stage of externalization, subyektivasi, and internalization which took place on the social construction process of television advertising (Bungin 2008: 38s / D39). Substance "Construction Theory of Social Media" is the circulation of information quickly and spreading evenly.

Constructed reality shaping mass opinion, people tend priori and tend to be cynical mass opinion. The position of "Social Construction of Mass Media" is a substance correcting weaknesses and complement "the social construction of reality", it puts excess mass media and media effect (Bungin, 2008: 194). Their social construction, the meaning of a social reality seen in the space of social life from the micro to the macro. The object consists of, first, television commercials; Second, the social construction as a scientific level; Third, the level of the individual. A television advertising media products created by the later televised advertising products for various purposes. Television advertising media segment is determined to have a media strategy. Their economic power and social change can not be separated from capitalism, as the strength of the economic sector changes that ad. Ad requires a substantial capital investment. When the media become the economic apparatus of the media makes the hegemony of importance (accessible by Zulham, "Roundtable discussion The Political Literacy Institute", Friday, January 18, 2013). The image of the product being advertised and then was used symbols for the image of the product, meaning that advertising, and awareness to build a social reality. Konsten construction of social media and social construction process of the birth of mass media through the stages as follows:

(1) Setting Stage Construction Materials

Setting up a social construction materials of mass media is the task of the mass media editors, distributed through desk editors in the mass media.

(2) Distribution Phase Construction

The distribution of mass media constructions using mass media strategy. The concept of concrete each different media, but the same main principles, namely real time. Distribution of television media construction using two-way models, their construction is still dominating the agenda setting by the media. The basic principle of the distribution of the social construction of the mass media is all kekhlayak information should be passed as soon as possible and exactly based on the media agenda. What is considered important by the media, it becomes important also for the viewers.

(3) Construction Establishment Phase Reality

i. Construction Establishment Phase Reality

News that has reached audiences in the formation of construction in the community through three stages: First, the construction of reality truth. Second, the willingness constructed by the mass media. Third, as a consumer choice,

ii. Construction formation Imagery

Formation of image construction is a building that desired by the construction phase. The models in the formation of the image construction, among others: First, the model of good news. Second, the bad models News.

(4) Confirmation stage

Confirmation is the stage when the mass media and the readers and viewers arguments and accountability to the choice to be involved in the formation of construction. For the audience, to explain why he is engaged and willing to be present in the process of social construction (Burhan Bungin, S. Sos., M.Si 2008: 195 s / d 201)

III. SEMIOTICS

Semiotic or semiology is a term that refers to the same meanings. Semiotics term is more commonly used American scientists, while semiology very thick with the feel of Europe inherited the tradition of Saussurean linguistics. Semiotic term often used in conjunction with the term semiology. In these terms there is no substantive difference, it depends where the term was popular. Semiotics is a significant science or how a sign is used to mean an event. Therefore, semiotics is an important tool in analyzing the content of the messages the media (Denis McQuail in Stephen Littejohn, 1996: 568). But clearly, both the study of the relationship between signs (signs) based on certain codes. Such signs will appear on the behavior of human communication through language, both verbal and gesture. Semiotics is a model of social sciences in understanding the world as a system of relations that have basic unit called a "token". Semiotics is derived from the Greek, meaning Semion mark. Semiotics (semiology) has become a popular analytical tools to examine the contents of the mass media and has been widely used by students of communication science in researching the meaning of the message contained in the mass media. Semiotics basically want to learn how to make sense of things humanity. Interpret in this case can not be combined with communicating. Interpret means that the objects are not only carry information, in which case the objects want to communicate,

So, semiotics is the science of signs. Science assumes that social phenomena or society and culture is a sign. That is, semiotic study the system, rules, allowing the signs mean. In addition semiotics, identify, mendokumentasikan, the classification of the types of signs and how to use it is representative. Because different types of signs every culture, the sign has created a variety of mental pencontoh which would have formed the view that will be owned by people of the world (Marcel Danesi, 2010: 33).

Peirce semiotics

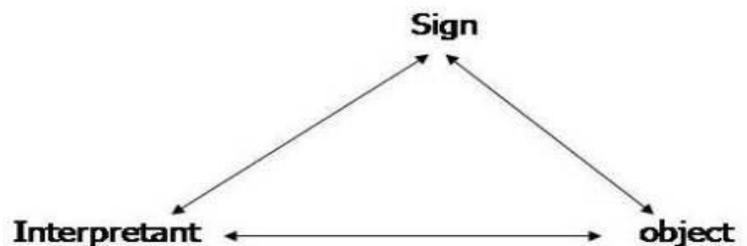
Source: Marcel Danesi, 2010: 39

PARADIGM SEMIOTIC Charles Sanders Peirce

Peirce known as the theory mark. Within the scope of semiotics, Peirce, presented by Lechte (2001: 227), repeating ngulang a mark that represents something for someone (Alex Sobur, 2006: 40). CS Peirce argued "sign as a hold someone as a result of the relationship with the response and capacity" (Athur Asa Berger, 2010: 1). Signs formation semiotic interpretation evoke the infinite, for an interpretation (the idea) that reads the sign as a warning to others (ie as a representative of a meaning or a marker) can be captured by other commentators. In his interpretation, the elements that must exist in linking the sign to its object (induction, deduction and hypothetical form three types of interpreters are important). So that there can be a sign, the sign is to be interpreted. According to Peirce, A sign is something that is used so that the sign can function called ground (events or habits that have relations) (Alex Sobur, 2006: 41). Consequently, there is a sign in the triadic relationship that is grounded, object, and interpretant. Signs associated with ground classified into Qualisign (Quality is on the sign), Sinsign (the actual existence of objects or events that exist on the sign), Legisign (norms contained by the mark).

Mark as representamen and concepts, objects, ideas to which it refers as the object. Based interpretant which is the meaning (Impression, cogitations, feelings and so on) that can be obtained from the sign (Marcel Danesi, 2010: 37). The signs on Rheme (sign when someone interprets based selection), dicent sign or dicisign (marked according kenyataan) and arguments (sign immediately give reasons for something) (Alex Sobur, 2006: 47). Tiga dimension always present in significant and as a triadic structure is not Binner.

The sign "Peircean



Source: Marcel Danesi, 2010: 38.

Based on the object, Peirce divides the top mark Icon (icon), Index and Symbol (symbol).

Type Sign	Relationship Among sign and source referent	Example

Icons	The sign was designed to represent a source of reference through simulation or equations (ie, a source of reference can be seen, heard, and so on, in the icon).	All kind images (charts, diagrams, and etc.), photo, words onomatopoeia, and so on.
Index	Signs are designed to indicate source reference or each other connect the source Acua.	Finger that appoint word information.
Symbol	Sign designed for encrypt cracked reference through an agreement or approval.	Social symbol.

CS Peirce Expresses, "First, when the call sign of an icon then follow the sign of the object properties. Second, the index mark as a reality or the existence of signs associated with individual objects. Thirdly, the sign of a symbol is interpreted as denotative object for their habit (T. Sibeok, 1977: 41). Where in any particular context can be a symbol icon. Many symbol in the form of icons. Besides being index, a sign could also serve as a symbol. The asterisk functions primarily as a tool generate meaning. Therefore, the mark is always perceived by the senses (sense) and the mind (reason). using Seha sense, one can connect a reference mark on the mark to find the meaning of (Ibnu Hamad, 2004: 18).

interviews, researchers attempted to collect data by conducting interviews with sources consist of superior and subordinate. The definition of supervisor, namely, Part media center of the National Mandate Party (PAN). The answer from the interview transcribed or recorded with the recorder (tape recorder) Time and place of the interview in accordance with agreed upon by researchers and informants. While documenting researchers collected books, magazines, articles from the internet relating to political advertising Hatta Rajasa with jargonnya "Populist accomplishing Amanah Rakyat" "PAN Populist, accomplishing Amanah Rakyat". Data analysis techniques in this study using semiotic analysis.

IV. RESEARCH METHODS

This study uses a constructivist paradigm. Where in this paradigm is based on the constructivist paradigm ontology is a social construction that is created by the individual (Burhan Bungin, 2008: 11). In this study used a qualitative research approach. Where there is a qualitative approach research with semiotic analysis approach. Semiotics is the study of signs (sign), object (referent), and the human mind (Morisan, 2010: 173).

Qualitative research approach by Kirk and Miller comes on qualitative observations as opposed to quantitative observations. The term qualitative research is a research or inquiry naturalistic or nature, ethnography, symbolic interactionist, perfective into, ethnomethodology, fenomenologis, case studies, interpretive, ecological and descriptive (Bondan and Biklen, 1982: 3).

In research methods, researchers simplify the data and process data based on the model paradigm of semiotics Charles Sanders Pierce, then the data is entered into the table of the image, Icon, Index and Symbol. Then the data in the analysis based on the theory of semiotics Charles Sanders Peirce. Subjects in this study were the perpetrators or pengkontruksi Political Advertising Hatta Rajasa, while the object of this study is the text or audiovisual recording Political Advertising "PAN Populist, accomplishing Amanah Rakyat" in television SCTV, RCTI, and Trans TV. Advertising MAPAN using a main model of the chairman of the National Mandate Party (PAN), Ir. Hatta Rajasa.

In this study using data collection techniques include: Interview (indept interview), and documentation. In conducting

V. RESULTS AND DISCUSSION

DYNAMIC CONTEXT OF POLITICAL ADVERTISEMENT Hatta Rajasa

The use of mainstream media such as television, newspapers, radio, magazines, in the wider political and social life certainly can not let go of the dynamic environment that occurred in Indonesia. The use of the television medium is intensified in a conventional ad serving perfective or political advertising in political communication. Political communication as indispensable to political activities such as political campaigns, propaganda, political rhetoric, lobby and negotiation, formation of public opinion, political publicity and a number of communication activities were important in influencing the political environment (Gun Gun Heryanto, M.Si 2011: 1).

Using the medium of television in political campaigns is a very effective political communication conducted by the National Mandate Party serve multiple ad content Hatta Rajasa. Especially in matters of political marketing (political marketing) to the legislative elections of 2014. Presidential elections or political party, a political institution that requires political image to attract the attention of the public by not giving the political promises and doing the movement a "real" to the public. One is by using advertising (advertising).

Political image is a bridge between the party's national mandate (political communicator) with the community. Therefore, the National Mandate Party used the publicity or favorable response (good impressions) that can benefit the political parties and the public. By displaying the figures Chairman and Chairman

of the party's national mandate of the Ministry of Economy Indonesia, Ir. Hatta Rajasa used to make political campaign in television media to spread its popularity through political advertising MAPAN "Forward Together PAN". Hatta Rajasa political advertising management (Fastcomm advertising agency) who use television to introduce personal Hatta Rajasa as chairman of the National Mandate Party and the presidential candidates of 2014 elections Presidential Candidate by making Entrepreneur program MAPAN "Forward Together PAN" (Interview Ma'am Hanira,

Blummer and Gurevitch told to study political communication Political ads MAPAN ie, First, political institutions (the party national mandate) in making political advertising that is FastComm Advertising Agency. Second, the media institutions that serve political advertising Hatta Rajasa as RCTI, Metro TV, Trans TV and others. Third, public or community orientation as a subject in political campaigns. Fourth, the cultural aspects of political communication needed by society and the dynamics of today's society the lack of jobs (Gun Gun Heryanto, M.Si, 2011: 30).

PAN using publicity paid political advertising campaigns MAPAN one form of imagery. Paid publicity is publitas by buying rubric, column or media air time. Ads from the beginning to advertise a product, service or idea of the institution or the candidate is direct, but the publicity is more soft and elegant way into the talk shows, editorial, documentary or program and rubrics as unplanned and formed (Gun Gun Heryanto, M.Si, 2011: 135-136). In this publitas, PAN buy air time or column of media (advertising) with a duration of 30 seconds to each of the television media for imaging. MAPAN ads which are ads ESTABLISHED program.

Hatta Rajasa their personal popularity in the community which resulted in the establishment of personal communication between individual one individual to another of the well-established advertising. As well as their recognition by the public of the National Mandate Party. MAPAN political advertising from the beginning is an ad product or an idea of the National Mandate Party that is soft and elegant in its message and its imagery. The existence of the programs offered to the community of the National Mandate Party. Steady manipulation Entrepreneur program needed by the people in the economic sector to reduce poverty and unemployment in Indonesia. In a political campaign, the National Mandate Party using candidat-oriented campaigns (Gun Gun Heryanto in his book Political Communication,

Where the party elite-oriented national mandate to acquire political power both in the legislative elections or the 2014 presidential powers through political advertising content broadcast on television. In political campaigns good use of political advertising in mainstream media or social media. But could use a political product. in political marketing PAN good use of political imagery to the public by going directly kemasyarakatan like MAPAN program, going home together, family planning outreach programs, student programs ESTABLISHED, and others.

PAN has a platform that contains azas or founding political institutions, the identity of the Party as well as the vision and mission of political movement. PAN has politicians from all walks of life, ranging from student activists, public figures, businessmen, political analysts, the elite government joined the cadre of the

National Mandate Party, the political message "real" to society (Interview Bima Arya Sugiarto, on Tuesday, 19 March 2013 at 12.00 s / d13.30 pm, held at the Mandarin Oriental Hotel, Kuningan, Jakarta).

Party political marketing used national mandate with the public display of the figures in the 2014 election of legislative candidates have a national mandate Party of team work or wing of the party in political movements, such as PARRA Indonesia, BM (Young Front) -PAN, TOWER, GMNI, PANDU (Results interview Rusli Halim, Chairman of the DPP PARRA Indonesia, on January 30, 2013, at 10.19am). PAN also berafiliasi with television media in political marketing because television has a powerful persuasive effect on society. National mandate Party political campaigns towards the Presidential and legislative elections in 2014, using above the line media (television, radio, magazines) in imaging poliriknya, not only was the National Mandate Party using bellows line media (Pamphlets, Brochures, Banyanya issue to the legislative elections or the presidential election in 2014 that was played by the PAN, either in the form of information through news issues, the policies on a problem that occurs as rising fuel prices. the controversy between the elite members of the board of various faction that supports and refuse as well as their rejection of society aspirated by students in front of the House of Representatives that each Stasium in television broadcast the news. There is also a political ad that contains symbols or signs on the nature of the movement of the party but not overtly mention the orientation of the ad, such as MAPAN ads served to raise elektabilitas PAN and personal Hatta Rajasa and recognition among young people (voters). National Mandate Party PAN has the slogan "Populist accomplishing Commission of the People" that was popularized to the public where the public can cast their vote or PAN in the presidential election in 2014.

POLITICAL ADVERTISING purport HATTA RAJASA jargon "MANDATE OF THE PAN fulfill populist"

Political advertising towards the 2014 elections aplenty utilizes state of the dynamics of community life. As a reference to show political advertising impressions. As cheap food, free trip, free education even for the training of Young Entrepreneur promoted by each party. Alongside performances ahead of the election or the Indonesian Democratic Akbar many political ads from each party sprung to public interest. Political parties who pass the screening KPU (General Election Commission) vying improve its image (elektabilitas). We can know, the mass media can influence or manipulate a person's view of what they saw. And can assist in providing good information information the social, political, economic, cultural, educational or daily life information. The number of televised political advertising into public consumption every day. Because of the media's role is now no longer a reality but change as hyperreality. Determine how perceptions of the mandate of the national party ads that aired on television. MAPAN ads aired on television even almost all TV stations, because the PAN in its staff structure is not involved in the media owner. Nearly every television station that serve ads with the aim to give informasai to society, especially among young people about the Steady Entrepreneur program.

Entrepreneurial MAPAN carried Jakarta on April 15, 2012 at the University of STEKPI, Kramat, Jakarta. In the ad ESTABLISHED, National Mandate Party as a political party that

held the program MAPAN "PAN Together Forward" to give the image (image) is good to the public. These ads berkonten for young people, especially the voters. Young people are still positioned as an object in the struggle for political party vote. Approach to political party is now very focused their reinforcement paradigm movement so apathetic voters in the 2014 elections through ads displayed on television. Historically, the younger generation is a group of people who helped determine the course of the nation's independence.

Hardly a milestone in the republic of Indonesia who deny the role of young people. From the days of the old order, the new order until the reform era the role of the young generation is very important for a nation, especially the people of Indonesia. Therefore, in this ad, ad format the PAN can construct reality MAPAN for youth issues in the community. With the depiction of the signs in the ad can manipulate people's minds into believing the ad content visible in the community. Besides the PAN political party imaging through advertising (ads). PAN jargon heard, "PAN populist fulfill the mandate of the people" coined by Ir.Hatta Rajasa so that people know and their close public attitudes chose the National Mandate Party in the 2014 elections.

Their desire to focus on two things: the word "populist" that fulfill the mandate of the people, because during this time many politicians in government or leader who does not mandate

that does not fight for the trust of the people (Interview Bima Arya Sugiarto, on Tuesday, 19 March 2013 at 12:00 s / d 13:30 pm, held at the Mandarin Oriental Hotel, Kuningan, Jakarta. There is anxiety of young people in difficulties in finding a job today become the dynamics that occur in Indonesia. the matter of young people ranging from an inability on what should be done in entrepreneurship, does not have a large capital in the manage entrepreneurial, do not have the skills or knowledge within the meaning of the concept of wanting to run in entrepreneurship.

Therefore, the presence of ad ESTABLISHED, PAN nasioanl will provide assurance to the public in making entrepreneurs from any aspect, from the terms manajemntnya or sales because people lack knowledge of how or strategy that should be done in berwirasusaha (Interview Ms Noni, Team Creative Advertising politics of the National Mandate Party, on Wednesday, 22 may 2013 at 11.00 s / d 14:00 pm housed in Fastcomm advertising agency). Desire Hatta Rajasa with well-established entrepreneurial program to make poverty and unemployment in Indonesia decreased. Based on the survey results of the Central Bureau of Statistics, 2012, which is quoted in the journal 15 Years of Reform: Expectations and Challenges and Research Institute for Sabang-Marauke Circle, the percentage of poverty level (%) and declining unemployment (%).

Table I
Poverty level (%)

Year	Poverty level
1998	24.23
1999	23.43
2000	19.14
2001	18.41
2002	18.2
2003	17.42
2004	16.66
2005	15.97
2006	17.75
2007	16.58
2008	15.42
2009	14,15
2010	13.33
2011	12.36
Mart-2012	11.96

Source: Central Bureau of Statistics, 2012

Advertising ESTABLISHED, existence of social reality into the social dynamics that occur, constructed by the television media by displaying the events happening in the community and is a matter of doing entrepreneurial young people. In Ad ESTABLISHED, we consider the program to be aired and unishaling own unique that could be the main attraction and foster a good image in the community. As well as the paradigm of the public that the events shown by political ads such as the National Mandate Party really happening in society. Social reality can happen in reality the media are deliberately constructed by

copywriters (makers of advertising copy) or advertising agency. Where in advertising MAPAN constructed by Fastcomm as advertising agencies.

Eventnya their reservations in advance, no advertising or advertising them, kesosial publication media first and then, make a creative advertising agency fastcomm material is interconnected between the creative and the party's national mandate and will exit its output or branding idea (the concept of ad creation). The results of the branding idea is the implementation of branding a Political Advertising ESTABLISHED (Interview Ms Noni, Political

Advertising Creative Team of the National Mandate Party, Wednesday, 22 May 2013 at 11.00 s / d 14:00 pm housed in Fastcomm advertising agency).

Training Entrepreneurial Steady: a training, the competition of businesses, business clinic and division of venture capital to the young generation (Interview Ms Noni, Team Creative Political Advertising National Mandate Party, on Wednesday, 22 May 2013 at 11.00 s / d 14:00 pm housed in Fastcomm advertising agency). Advertising Entrepreneurial Steady reconstructed, beginning their providing information, socialization program is well established, solicitation, utilizing above the line media (television, radio, newspapers, magazines), the bellows line media (brochures, plamplet, banners) and new media (internet or website Entrepreneurial -Established).

In constructing reality in rent ESTABLISHED, Fastcomm advertising agency pack the ads MAPAN into the program MAPAN by inviting the public, so that people enroll into entrepreneurial activity ESTABLISHED (Interview Ms Noni, Team Creative Political Advertising National Mandate Party, on Wednesday, 22 May 2013 at 11:00 s / d 14:00 pm housed in Fastcomm advertising agency). Their decision to enroll and enthusiastic audience in following well-established young entrepreneurs program. Then, of the enrollment process in various cities, 11 cities including Jakarta-Bandung-Surabaya-Medan-Palembang, Makassar, Jayapura, Aceh, Banjarmasin, Lampung, Yogyakarta (Interview Ms Noni, Political Advertising Creative Team of the National Mandate Party, Wednesday, 22 may 2013 at 11.00 s / d 14:00 pm housed in Fastcomm advertising agency).

Entrepreneurial training ESTABLISHED, First, workshop activities during the three days in the respective cities. The participants are given the motivation, direction, guidance and enrichment in the opening of entrepreneurship and provide direction or opportunities or markets that is around us (Personal interview, Ms Hanira, Advertising Agency Creative Team Fastcomm, on 3 April 2013 hours 10:00 to 12:15 pm in Fastcomm Advertising Agency). When the workshop participants must

submit its plant business venture in the form of an idea what they would have. Second, the filtering proposal is so tight and require the participant has opened his own business field either open screen printing, culinary even bag factory.

Third, Their presentation in front of the jury, the effort that has been lived. Their briefing-debriefing of participants who escaped from Mapan Entrepreneurial training. The existence of the enrichment of the business they pursue, the participants get cash assistance in developing a business with the monitoring of the well-established entrepreneurial training. Until now the winners of the proposals and the best participants earn money in the manage entrepreneurial development. Hatta Rajasa their willingness to Steady entrepreneurial training programs to make the Indonesian economy is getting better, pengguran numbers dwindling with the persistence of young children in the manage and develop their entrepreneurial will to live. As well as reduce poverty the Indonesian issue today which has not found a bright spot.

SIGNS AND MARKERS OF POLITICAL ADVERTISING constructed HATTA RAJASA using "PAN populist, perform a TRUST PEOPLE"

In a study of political ads Hatta Rajasa that there MAPAN ad sense or meaning that is conveyed by the actors of political parties to the public. Through signs that are consumed by an audience that is placed in the drawings mass media advertising aired by the advertiser (Advertising Agency). Signs and markers submitted by copywriter to the public for the construction phase of the figures the community paradigm chairman of the National Mandate Party. Even their manipulation by political ads so that people believe even directly selecting items in the ads they see television. Through good advertisement advertisement konvesioanal or political advertisements offering its products in order to get a good image of the community.

Table 1, "opening in advertising ESTABLISHED, starting with the representation of the market"

	
<p>icons</p>	<p>market atmosphere, carrying a paper that read "Want to Work There is No Vacancy". A young man (man) who was exploring the market situation mornings. And communicating the tangible reality experienced by the people, especially among the young.</p>
	<p>Hustle traditional markets in Indonesia describes the economy by buying and selling system. A man who uses a blue shirt and holding an article "Want to Work There is No Vacancy" in a crowd of the market or in the midst of traditional traders. Adan</p>

Index;	their anxiety confusion emanating from the young person pictured in a white paper that reads "Want to Work There is No Vacancy".
symbolization	Icons and marks contained verbal message keterpihakan PAN against the Indonesian economy system. Which is analogous to the traditional market situation as the identity of the Indonesian economy.
Interpretan	Indonesia's economic sectors hustle a traditional market. The process of buying and selling as well as their effective interaction or communication made by the seller and the buyer.

In scene 1 in advertising MAPAN. there is a special value in the presence of signs consumed by making the commodification between scene and scene ad serving one another. For the author, Ad Serving both conventional advertising generates publicity or political advertising and political campaign of a political party media ads aired on television, among other things: There is restlessness of young people who have a desire to work but there is no vacancy be a problem this time. Hustle to make the market economy system example in Indonesia, there is a process of buying and selling of the middle class. But not describe the competition in finding a job in the scene.

PAN using this type of political advertising is advertising issues in the release. Issue ads are ads that contain a program or a

policy or discuss on topics of public concern at this particular time and related to the national interest (Gun Gun Heryanto, MSi, 2012: 36). PAN imaging using the image of the traditional market or defend the image of the traditional market. PAN describes the traditional market muddy, messy management systems into the National Mandate Party criticism against the ministry of trade so that generalize the traditional market with a modern market with good management systems. in addition, the National Mandate Party in MAPAN ad depicts the restlessness of young who do not have jobs they do.

Table 2, "Routines in the Park"

visualization	
icons	Ad MAPAN second scene: a woman wither china sitting in the park at dusk, carrying a paper that read "Want to Choose Business Enterprises but Confused". Meilani was a walk alone to the park Meilani keinganan kepikiran have to work or want to open job field. Afternoon in the park into the activities of young children or elderly people walk, sit and jest. This picture tells the real reality that is experienced among the community.
Index;	Malay girls wear dres china white, shoulder length hair wearing bangs were visible sitting in the park with paper and labeled "Business can but Confused Select Enterprises", denotes worry and anxiety in his heart. Parks are where young children or the elderly who like to hang out or bring their children to play in the afternoon.
symbolization;	Icons and messages contained verbal sign the paper with the beauty and tranquility urban park located in an area. As well as the National Mandate Party keterpihakan against the system which is reflected in the beauty of the city such as the park layout.

Interpretan	restlessness their independent women who want to entrepreneurship but confused attempt what you want to do. Hustle their garden into a commodity trading system of small traders.
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In the second scene, the anxiety felt by the men and women who have a desire to work or entrepreneurship but there is still confusion in determining what would entrepreneurship. Exposure to cultural and ethnic diversity in Indonesia is the diversity that characterizes Indonesia. PAN using this type of political advertising is advertising broadcast issues in the second scene. Imaging PAN describe the image of young people who lack the training or lack of human resources for young entrepreneurs in doing business. National Mandate Party described the situation as a refreshing garden saturated youngsters on life issues ranging from not having jobs, breakups and more. Currently we rarely find situations or spatial urban parks in the city of Jakarta, be mixed into the ruling elite that created the urban planning in Jakarta as a means of greening. PAN describes the anxiety of young people who do not have jobs they do. The sharp criticism for the government elite in reducing the number of unemployed in Indonesia.

Table 3, "Reality Among Campus"

visualization	
icons	the words "Would not Have Capital Enterprises". Campus atmosphere that describe the activities of young people in education. Its desire to create jobs for people around.
Index;	A student uses a shirt, carrying a bag as well as the words "Campus C" and holds the inscription "Do not Have Capital Enterprises Mau" sitting ditangga as well as the events that occur within the campus. Signs of a white paper containing paper is a thought or desire in the hearts of entrepreneurship but does not have any capital.
symbolization;	Icons and marks contained verbal messages; With their strong determination to independent entrepreneurship for young people. By opening an independent entrepreneur, their problems must terbenturkan or a problem does not have sufficient capital to young entrepreneurship.
Interpretan	Seen in the picture, a student who has a classical problem in entrepreneurship which does not have the capital, the concept of entrepreneurship is looming in his thoughts. Students are agents of change for society, especially in the economic sector.

In the third scene.MAPAN ad in political imagery. Imaging PAN portray the image of students in Indonesia, has a passion for young entrepreneurs open field independently but students hampered by substantial capital to become young entrepreneurs. The situation makes the campus lectures or scientific dialectic system. In order to have a strong desire of a student to improve the Indonesian economy by opening up a wide range of entrepreneurs will be acquired. The design and conceptual marketing is ripe for a run. However, the lack of capital in the manage entrepreneurial will they do. With classics such problems, Students as Agents of change for the community was able to overcome a lack of capital at maturity and courage in creating jobs.

Table 4, "Routines in the Environment Bus Stop"

	
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visualization	
icons	MAPAN ad impressions fourth scene, a young woman or student standing in a bus stop, carrying a paper that read "Want Enterprises but Fear of Loss". Atmosphere bus stop or routines that describe the activities of the public using public transport accommodation through the bus stop to do the job.
Index	an indigenous woman wearing shirts island of Java with a carry bag was waiting for a bus at the bus stop. Their entrepreneurial desire in his heart, but there is fear or anxiety is described by the paper holding a post "Want Enterprises but Fear of Loss".
symbolization	Icons and marks contained verbal messages; With the self-determination for the young entrepreneur. By opening an independent entrepreneur, the students hit the big capital or the fear of loss if the self-employed and do not know the opportunities that occur in the environment around.
Interpretan	Seen in the picture, the bus stop is a means of public transportation stops in the middle every day departure home or work, which can be a trade by the public sector.

In scene 4, MAPAN ad impressions, the National Mandate Party political imagery in advertising MAPAN using the image of young people who lack the sales management training and lack of human resources to be a young entrepreneur. In the ad, the National Mandate Party described the situation as a bus stop where the ups and downs of public transportation vehicles in Indonesia. The bus stop is a means of public transport stops for people to do activities sehariannya good work, school, and more. When I was at the bus stop, a young boy there is unease that is felt in finding a job. A strong desire of a young boy in improving Indonesian economy in order to obtain an increased rate of the Indonesian economy from year to year. By way of open field independent entrepreneurs. However, the fear of loss in the manage field of entrepreneurs makes a classic problem today.

Table 5, "The situation at the In Train"

visualization	
icons	
Index	

train an accommodation that is used all the community to carry out routine work every day.

The crowds portrayed in the routine train Indonesian society, to and from work or perform routine use rail services. A man of Papua sit among the other passengers. Then the man stood up. Terhentak, the willingness of independent entrepreneurship but confused procedural issues in entrepreneurship. Illustrated with the words "Enterprise Gak Mau Get it how".

Symbol	Icons and marks contained verbal messages; nescience their management system and the development of entrepreneurship because there was no debriefing or briefing to be a young entrepreneur. Therefore, the program MAPAN "Forward together PAN" is able to overcome the problems in developing entrepreneurship.
Interpretan	A strong desire of young men from Papua who wants to be a young entrepreneur but lack knowledge in procedural system sales, business development become a bottleneck to entrepreneurship.

On the scene 5.Advertising ESTABLISHED, in political imagery portraying the image of young people who lack the training or lack of knowledge of how young entrepreneurs pengelolaan run independently (young entrepreneurs) were undertaken. In the ad, the National Mandate Party crowd described the situation in the rail becomes a tool widely used public transportation in performing daily activities. Starting from work, school, college, went to the market, and others. Concerns of young people of Papua, who want to work but can not jobs. Strong optimism for entrepreneurs who make the open field for growing inflation barometer State and Indonesia can foster economic growth in the foreign sphere. Which makes the classic problems in open employment problem is the lack of knowledge and entrepreneurial management pengelolaan. It all makes another problem that must be destroyed by the young generation.

Table 6 "Audiovisual Yang Di Spell By Ir. M. Hatta Rajasa. "Get hold of your determination, Discard Ragumu"

visualization	
icons	MAPAN ad impressions sixth scene, Ir. Hatta Rajasa, the Chairman of the National Mandate Party. Their market background, invite all the community to participate in the program ESTABLISHED, "Forward Together PAN". Audiovisual sound Hatta Rajasa expressed by the public that is "Throw your resolve Rounds Ragumu" a stimulus given to all the people of Indonesia.
Index	Traditional markets are the backbone of the economy of the small people. There is a purchase transaction between the seller and the buyer becomes familiarity built up. Problems in entrepreneurship making threats in managing the business. Young people who watch the ad impression ESTABLISHED, can follow, registering Entrepreneurial-state program to be able to take the initiative to build an entrepreneurial early. Make sound audiovisual stimulus to the community, especially young people to become independent young creative entrepreneurs. By way of rounding your resolve, throw ragumu able to develop and build up entrepreneurship to be lived. Hatta Rajasa invited to remove all doubt as to have a high spirit and creativity in managing the effort does not require a large capital.
symbolization	Icons and marks contained verbal and non-verbal messages occur process of selling and buying. An Indonesian community's economy will progress if its people do entrepreneurs from bottom and have a desire to expand the business to be great.

Interpretan	Seen in the picture, the audiovisual expressed Ir.Hatta Rajasa to invite all the people of Indonesia to follow-Steady Entrepreneur program and remove the negative mind entrepreneurship before we tried it.
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In the sixth scene.MAPAN ad impressions, the political imaging displays Ir. Hatta Rajasa as Chairman of the National Mandate Party as a forum to raise elektabilitas as a candidate for President in 2014. Although elektabilitas political party or chairperson has fallen yet introduced into a new paradigm in political parties. Their combination of Ir. Hatta Rajasa invites young people and all people aged 17 years to 25 years to follow ESTABLISHED Entrepreneur program. Strong desire expressed by Ir. Hatta Rajasa as Chairman of the National Mandate Party. He invites the entire community of the bottom line, the middle, to line up in order to follow-Steady Entrepreneur program or to become a creative young entrepreneurs. Therefore, can provide the solution of the problem of poverty or unemployment by our independent entrepreneurship. Its imagery describes the personal image Ir. Hatta Rajasa displayed in MAPAN ad impressions, to convince young people to become young entrepreneurs with exposure expressed namely your determination Rounds, discard ragumu following ESTABLISHED entrepreneurship program.

Table 7, "Entrepreneurial Wash Motor"

visualization	
icons	MAPAN ad impressions seventh scene, boy Papua named Frans already have entrepreneurial Wash Motor. Frans tear the paper held with the words "Not Understand How Business Wants," which became the case, time is on the train crowd. Background turns into a washing motor into a well-known entrepreneur who gelutinya.
Index	A man came from Papua carries on business through a leaching motorcycle by following MAPAN program, he tore the paper that said "Want to Understand How Gak Enterprises" in railway signaling unease felt within the heart and mind. Entrepreneurial washing the motorcycle is Frans effort today. Business opening laundering funds motorcycles do not require substantial funds simply by having the wash and tools that are used to wash the vehicle. Frans obtain good support for economic progress in Indonesia in particular to reduce unemployment and poverty in Indonesia
symbolization	Icons and marks contained their verbal or toughness of a child kekegigihan Papua in running entrepreneurship. With sincere intention and strong optimism makes what they dream come true of having good business famous steam engine audience is able to reduce the number of unemployed. The community now has a job and bustle in creating jobs or become self-sufficient young entrepreneurs.
Interpretan	After Frans follow Steady Wirusaha- program builds entrepreneurial problems are erased and become an independent entrepreneur with what is being undertaken at this time

In scene 7.MAPAN ad impressions, there is anxiety in political imaging of young people, namely Frans came from Papua capable merentas Entrepreneurial poverty in the follow-state program of the National Mandate Party. He provides jobs that steam washing the motorcycle. In image building, the National Mandate Party held MAPAN entrepreneurship program, in order to be able to do an entrepreneurial young people wherever he berada.Konsep of the training program Hanyan MAPAN not provide concepts or procedures for doing business at one focus alone but all sides are applied in the training , Society was not initially have knowledge in managing the run entrepreneurial creativity. PAN give confidence to the community in terms of management penjualann because people lack knowledge of how and strategies applied in berwirasusaha (Interview Ms Noni, Team Creative Political Advertising National Mandate Party, the Day of Wednesday, 22 May 2013 at 11.00 s / d 14:00 pm housed in Fastcomm advertising agency). As well as the participants were given \$ 5 million venture capital for business pengelolaan lived.

Table 8, "Agro Entrepreneur Business"

visualization	
icons	<p>Malay china daughter named Meilani already have entrepreneurial Agribusiness plantations. Meilani tear the paper that reads "Want a business but a loss for the enterprise" the problems facing the nation today. After participating in the program ESTABLISHED, Meilani have progress in the business carried, capable of reducing the number of unemployed because people already have jobs and creating jobs Meilani young are independent. Meilani is one of the young people who take the program to be an entrepreneur by profession MAPAN agribusiness.</p>
Index	<p>China girls wilt carries on business through agribusiness or plantation. By following a program ESTABLISHED, Meilani tear the paper that reads "Want Enterprises but Confused Looking efforts", who was held in the Garden. The article indicates anxiety or confusion experienced by Meilani the presence of the article to be known publicly.</p>
symbolization;	<p>Icons and verbal signs contained the kekegihan and mental toughness of a young man in running entrepreneurial world as manage or develop plantations or agribusiness. With sincere intention and has a strong optimism makes dreams come true. Being able to reduce the number of unemployed.</p>
Interpretan	<p>Meilani after follow-MAPAN Entrepreneur program, the problems will be erased entrepreneurial and able to undergo its business estate business (agribusiness).</p>

At the scene 8.MAPAN ad impressions, the political imaging of young children there is anxiety, which comes from china wilt melani has successfully followed the Entrepreneurial-state program of the National Mandate Party. Strong desire and have a thorough knowledge, Meilani capable of creating jobs is the tea plantations. Imagery that was constructed in the National Mandate Party MAPAN entrepreneurship program, in order to build the image of young people in order to create jobs independently wherever located. This training not only gives one berwirausahaan concept but rather a variety of ways and strategies in pengelolaan, business development

that will be undertaken by each participant. Initially the participants do not have the knowledge and skills in pengelolaan strategy in running the business. With this program,

Table 9, "Entrepreneurial Cassava Chips"

<p>visualization</p>	
<p>icons;</p>	<p>A man named General of indigenous origin java become entrepreneurs Cassava Chips. Supreme tear the paper that reads "Want to Work There is No Vacancy" which became a phenomenon problems in life. However depicted their background cassava chips cart illustrate, the Supreme already have a well-run business.</p>
<p>Index;</p>	<p>Cassava chips business is a business that is run by the Court in the manage cassava snacks like chips with a variety of sweet and spicy taste salty. In entrepreneurial cassava chips do not require large funds have enough carts and basic processed materials of cassava chips, the Supreme earn maximum profit. The work done by the Supreme obtain support to improve the economy and reduce unemployment and poverty in the area of residence. Worry and anxiety that is felt initially, has been destroyed by their depiction of ripping paper that he held while in the market.</p>
<p>symbolization;</p>	<p>Their kekegigihan or mental toughness General in carrying becoming entrepreneurs such as cassava chips and cassava manage diverse flavors. With sincere intention and strong optimism makes what many dream come true of having good business cassava chips are famous people who were able to reduce the number of unemployed because people already have jobs and bustle of the people who have been creating jobs independently.</p>
<p>Interpretan</p>	<p>After the Supreme follow-state program Entrepreneurial these problems can be erased and doing business or establish an independent entrepreneur initiated by this activity.</p>

At the scene 9.MAPAN ad impressions, in their political image persistence in improving the lives of young people from the sector of the economy. They are able to conduct independent entrepreneurs have found success. In essence, with a strong desire and knowledge that mature during the program MAPAN entrepreneurial training, the Supreme can create jobs that is selling cassava chips. Imaging PAN entrepreneurship MAPAN with programs by using the image of young people who want to create jobs and be creative and innovative young entrepreneurs.

In this training, the concept of entrepreneurship which is run not only focus one strategy, but many business strategies executed. Initially they are, do not have the skills or knowledge within the meaning of the concept of wanting to run in entrepreneurship. With mengikuti this program, they have the knowledge and confidence (belief) that they are capable of creating jobs with entrepreneurship. As well as MAPAN program, participants are given a \$ 5 million venture capital for business pengelolaan lived.

Table 10, "Entrepreneurial Recycled Bags"

<p>visualization</p>	
<p>icons</p>	<p>MAPAN ad impressions tenth scene. Seen a woman named Flower. Young people to become entrepreneurs Bag Recycling. Flowers tear the paper in his hand and threw it. Background turns into a recycling bag shop and already have a business carried names in place of registration information are MAPAN entrepreneurial training in 11 cities including Jakarta-Bandung-Surabaya and Medan.</p>
<p>Index</p>	<p>Bag Recycling is an entrepreneur who exploited by some people of Indonesia to be recycled as waste into material suitable to be used as tas. Wirausaha Recycled Bags carried by interest can obtain a good support for economic progress in Indonesia in particular to reduce unemployment and poverty in Indonesia. Initially, the fear and anxiety Flowers by writing "Want Enterprises but Fear of Loss" destroyed by ripping the paper in his hand while at the bus stop. The white paper that reads "Want Enterprises but Fear of Loss" is confusion or anxiety they experienced.</p>
<p>symbolization</p>	<p>Icons and marks on the pictures contained verbal message regarding kekegigihan or mental toughness in running entrepreneurial young people, by making use of used goods that are recycled (Recycled Bags) into a decent used goods such as bags, pencil cases, Etc. With sincere intention and strong optimism makes what many dream come true. The business can reduce the number of unemployed because people already have jobs and bustle to earn an income.</p>
<p>Interpretan</p>	<p>After Flowers follow-Steady Entrepreneur program entrepreneurial problems will be erased and can run a business that is open Recycled Bags. Flowers also get information about the city's ongoing program implemented.</p>

At the scene 10. MAPAN ad impressions, the political imagery depicted their strong spirit and optimism of young souls can evoke apathy of young people in the field of politics. But with perseverance and toughness as well as the skills of the younger generation is able to remove the apathy by following ESTABLISHED Entrepreneur program. With the aim to improve the lives ranging from the economy to perform independent entrepreneurs who have found success. With the knowledge that mature through entrepreneurship training program ESTABLISHED, Flower capable of creating jobs that entrepreneurs Recycled Bags. Imaging PAN entrepreneurship program by holding ESTABLISHED, through the image of young people by young entrepreneurs or become entrepreneurs. MAPAN entrepreneurial training,

Table 11, "Entrepreneurial Sablon"

<p>visualization</p>	
<p>Icons;</p>	<p>MAPAN ad impressions eleventh scene. A man named Good, a student who became entrepreneurs Sablon. Good tear the paper that there is writing and change the background of the shirt screen printing businesses already have names in the business that they do. There's information on the area, where the program sign MAPAN in Palembang, Makassar, Jayapura, Aceh, Banjarmasin, Lampung, Yogyakarta.</p>
<p>Index;</p>	<p>Shirt screen printing is performed by Good entrepreneurs who obtain good support for economic progress in Indonesia in particular to reduce unemployment and poverty in Indonesia. The fear and anxiety experienced by Bagus destroyed by ripping the paper in his hand while on campus. The white paper that reads "Want Enterprises but not Have Capital" is confusion or restlessness when trying to build a business.</p>
<p>symbolization</p>	<p>Contained message their tenacity or toughness of life of young people in entrepreneurship as entrepreneurs running shirt screen printing, which aims to reduce the number of unemployed in Indonesia. With sincere intention and strong optimism makes what they dream come true. By creating jobs augment household incomes and bustle of people to work.</p>
<p>Interpretan</p>	<p>After a good follow-Steady Entrepreneur program will be erased entrepreneurial problems with doing business. This picture also give information about the place or area berlangsungkan Entrepreneurial-state program.</p>

At the scene 11.MAPAN ad impressions, the political imagery there is a spirit and optimism that strong spirit of young generation to evoke a spirit of apathy of young people in the field of politics. But with perseverance and toughness as well as the skills of young children were able to remove the apathy by following ESTABLISHED Entrepreneur program. Starting from sectors of the economy, communities are able to improve their lives by doing independent entrepreneurs who have found success through a mature knowledge given moment entrepreneurship training program ESTABLISHED, Nice can create jobs that entrepreneurs shirt screen printing. Imaging PAN entrepreneurship program by holding ESTABLISHED, using the image of a young child is capable of running an entrepreneurial wherever its place and become young entrepreneurs shirt screen printing.

Table 12, "Socialization Entrepreneurial-state" Forward Together PAN "by the PAN chairman Hatta Rajasa"

<p>visualization</p>	
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Icons;	Impressions scene 12th, Visible in the image Ir. Hatta Rajasa is Chairman of the PAN against the background of the market, invites all people of Indonesia to participate in the program ESTABLISHED, "Forward Together PAN". Non-verbal signs that mentioned by Ir. M. Hatta Rajasa. VO: "Follow the Entrepreneur program ESTABLISHED, Forward Together PAN".
Index;	Traditional market is the economic system that is always done by the people of Indonesia to memenuhu daily needs. Changes will be realized like the trader that can lift the economy of his country in the eyes of the world. Their stimulus Hatta Rajasa expressed in MAPAN ad is "Follow the Entrepreneur program ESTABLISHED, Forward Together PAN". Aims to encourage all people to follow entrepreneurial training ESTABLISHED. As well keterpihakan Rajasa's Ir.Hatta promoting all sectors of the economy in the eyes of the world.
symbolization	To follow the "Follow the Entrepreneur program ESTABLISHED, PAN Together Forward" is able to create young entrepreneurs who self-creative and innovative entrepreneurs.
Interpretan	Ir shown in FIG. Hatta Rajasa as Chairman of the National Mandate Party invites all people to participate in the program ESTABLISHED, "Forward Together PAN". With entrepreneurship, employment opportunities and reduce poverty and unemployment that became problematic in Indonesia. As well as the numbers will stabilize the economic system in the eyes of the world,

At the scene 12.MAPAN ad impressions, the political imagery, the National Mandate Party featuring Ir. Hatta Rajasa as Chairman, to popularize the image of political parties as well as personal chairperson. Ir. Hatta Rajasa expressed in this scene to Follow Entrepreneur program ESTABLISHED, Forward Together PAN ". He invites all the youth of the bottom line, the middle, until the top line so that follow-Steady Entrepreneur program separately into independent young entrepreneurs. The issue of poverty and unemployment in this country can be eradicated by means of entrepreneurship from an early age. Hatta Rajasa defend invites all young people with young people from the bottom line, to line up for the follow-ESTABLISHED Entrepreneur program to address the issue of unemployment in the economy. Opportunities that come in addition to creating jobs but able menyejahterahkan others and give kebahagiaan others for getting income from business carried on by each young child. The main image of this scene is a personal image Ir. Hatta Rajasa as chairman Hatta Rajasa who invites the youth to become young entrepreneurs who are creative, independent, and innovative, and to defend the traditional markets as a day trading system needs a day as Indonesia's economic sectors with the program ESTABLISHED.

Table 13, "Entrepreneurial Logo-ESTABLISHED"

visualization;	
icons;	MAPAN ad impressions, MAPAN logo are raised in this ad. Figure Entrepreneurial MAPAN "Forward Together PAN" with website www.wirusaha-mapan.com as the name of the program will Run as a program of the National Mandate Party.

Index;	Entrepreneurial Steady "PAN Together Forward" is a program of the National Mandate Party "Populist PAN accomplishing Amanah Rakyat" coined by Hatta Rajasa to invite all the community to follow-state entrepreneurial program. The goal for the PAN is kept up-loved by the community and are able to blend and embrace the community through this program.
symbolization	PAN invite all the community through programs MAPAN to embrace young people have a desire to be an entrepreneur so creative.
Interpretan	Seen in the picture, there is a logo Entrepreneurial-state is a program initiated by the National Mandate Party devoted to the generation of high spirits membangunsektor eyes of the world trade and economy.

At the scene 13.MAPAN ad impressions, in politics there is a logo Entrepreneurial imaging-state is an entrepreneurial program initiated by the National Mandate Party devoted to Youths who have high spirit especially in the trade and economic system. As well as embrace the younger generation to be more creative and entrepreneurial inovatid doing. The main image of this scene is the image of the institution or the image of entrepreneurs MAPAN program that initiated by Ir. Hatta Rajasa as chairman Hatta Rajasa invite young people to become entrepreneurs. With the provision of entrepreneurial workshops, the keynote speakers were reliable in business building young people and change mainset young children in developing entrepreneurship. The program is also the arena of sharing or exchange ideas strategy to be carried out in running the business.

Table 14, "Logo PAN"

visualization	
icons;	Last impression advertising ESTABLISHED, National Mandate Party logo appears with the tagline PAN populist People's logo Mandate accomplishing the sun to break through into all walks of life and can enlighten all people anytime and anywhere.
Index;	One of the National Mandate Party 2014 election contestants with no order of 8 on the 2014 election ballot papers.
symbolization;	PAN populist People's Mandate accomplishing more togetherness and embrace all of the top, middle or bottom. Indonesia's economy as well as their change with new breakthroughs such as MAPAN program makes the younger generation has the willingness and ability to become new entrepreneurs are creative when the public chose the National Mandate Party.
Interpretan	Seen in the picture, the logo of the National Mandate Party which is contesting political parties diranah Indonesian politics. PAN with no serial number 8 in the 2014 elections.

At the scene 14.MAPAN ad impressions, in the image of the institution there is a political imaging PAN to encourage young people to become entrepreneurs a creative, independent, and innovative with MAPAN program. Their MAPAN Program, in order to encourage elektabilitas National Mandate Party in the eyes of the people of Indonesia and to build public opinion against

elektabilitas Hatta Rajasa and National Mandate Party Presidential elections of 2014. The existence of the National Mandate Party's political image by following MAPAN program, among the younger generation who portrayed that this party and chairman of the generally pro-traditional markets as the economic system of buying and selling in the people and in the eyes of the world. Hatta

Rajasa defend small traders attempt to cut unemployment in Indonesia. Hatta Rajasa also supports young people to become entrepreneurs despite the fact that many of the problems experienced. But by following MAPAN program, the problem will disappear and the dream of entrepreneurship into young entrepreneurs will be realized.

Steady on each ad Entrepreneurial have a scenario in broadcast, ranging from advertising broadcast of the images on the first through fourteenth scene describe Ir. Hatta Rajasa care for the fate of the nation today. How to reduce the rate of unemployment, poverty and boost Indonesia's economic sectors with entrepreneurship. Harmonious relationship between the position of Ir. Hatta Rajasa as Coordinating Ministry for Economy Indonesia are able to take the idea of the idea for creative young people, young and independent. Since the soul of a young child has a soul that leads Indonesian morale of the colonial system to the current democratic era. It is expected that with the fighting spirit of young people, able to stabilize the economy and increase the pace of the economy of Indonesia in the eyes of the world. However, problems Hatta Rajasa as chairman of the National Mandate Party enters political competition is the presidential candidate of 2014 is considered very difficult and strenuous. We can see the figure of personal elektabilitas Hatta Rajasa as a presidential candidate is still low, the National Mandate Party elektabilitas towards the 2014 elections have not been any significant increase in elektabilitas than the other party.

Party competition as PDIP and Golkar Party which has a high elektabilitas in the public eye. Therefore, the PAN will lift presidential candidates promoted must have a high personal ability in the public eye. By way through the advertising program "ESTABLISHED". Hatta Rajasa invites all society, especially the younger generation to follow this program. Entrepreneurial-ESTABLISHED program is a performance conducted by the National Mandate Party to get a good image to the public. But in Rakernas still prioritize Hatta Rajasa promoted as a candidate for President in the 2014 election. Of course, various methods are used as well as their evaluation is not only to raise the personal elektabilitas Hatta Rajasa alone but their evaluations to improve the performances of politics as a means of control of the party in the 2014 election victory For researchers, Hatta Rajasa political movements not only do the moment when the Presidential Election , but sustained political movement of a dialectic discourse. Hatta Rajasa political movement must be oriented in all walks of life, not on the public capital city but to penetrate remote areas. To the researchers have to be critical in a political ad serving with all kinds of concepts that display, among others (1). Can understand and appreciate the existing political ad impressions and aired on television or new media. (2). Can understand the signs that are in political advertising and the meaning of political ads aired on television. (3). Can select the information or political advertising products that will be consumed by individuals and society. (4). Can understand the impact of a negative or positive content of political ads and programs that will be conducted by the political parties. (5). Limiting the amount of political ad serving political party even though it is one media owner (owner of the media authority). (6). Limiting the amount of political ad serving although the political party is the owner of a media owner (owner of the media authority). Can understand the impact of a negative or positive content of political ads and programs that will be

conducted by the political parties. (5). Limiting the amount of political ad serving political party even though it is one media owner (owner of the media authority). (6). Limiting the amount of political ad serving although the political party is the owner of a media owner (owner of the media authority). Can understand the impact of a negative or positive content of political ads and programs that will be conducted by the political parties. (5). Limiting the amount of political ad serving political party even though it is one media owner (owner of the media authority). (6). Limiting the amount of political ad serving although the political party is the owner of a media owner (owner of the media authority).

VI. CONCLUSION,

MAPAN political ads aired in the television ad based approach Charles Sander Pierce semiotic analysis can diamb il some conclusions that are expected to represent the entire contents of this article, as follows:

First, the set of meaning contained in the ad gives the sense that the purpose of the PAN MAPAN program featuring young people who become young entrepreneurs. This we can see from the beginning to the end of the ad MAPAN in serial aired on television station SCTV, RCTI, and Trans TV, berlapisnya main image of the image of the political institutions. Advertising MAPAN encourage young people become young entrepreneurs, people will MAPAN along the National Mandate Party. National Mandate Party defended the people with the reality series with imaging ads Hatta Rajasa (Chairman of the National Mandate Party) defending traditional markets and supports young people become independent young entrepreneurs. Various image problems of young people who have no vacancies, the image of a young child issues like business but are confused about what businesses,

Second, the range of marks used in advertising MAPAN of icons, indexes, symbolizing either verbal or non-verbal sign of a whole series of signs which give a meaning in advertising MAPAN to describe and introduce personal Hatta Rajasa among the community's candidacy in the 2014 election Hatta Rajasa Describing the activities of public life comes with the desire of young people to open up new jobs or entrepreneurship. These activities are often done by the communities are becoming routine. As well as the depiction not only of the lower classes who wants to open a new business but from the top also want to entrepreneurship-new entrepreneurs, especially the youngsters.

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Radio Companion: The Role of Sri Lankan Community Radio in the Sphere of Empowering Marginalized in the Society

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Abstract - *Community broadcasting involves radio by and for the community. In developing countries, community radio has a developmental mission and sees itself as uniting either geographical communities or communities of interest around common economic, cultural, or linguistic interests and themes. The role of the community radio is to respond to the priorities set by the community, to facilitate their discussion, to reinforce them, and to challenge them. Being the pioneer in the community radio broadcasting in South Asia, it is important to identify the potentials of CR in empowering marginalized in the society for a sustainable lifestyle. In order to identify the role of CR in Sri Lanka in the sphere of empowering marginalized, 8 leading community radio activists of Sri Lanka were interviewed by using semi structured in depth interviews. Reinforcing and facilitating the livelihood of resettled people under Mahaweli Development Scheme, Empowering the proper representation and participation of people in development (decentralized decision making), Fulfilling the need for information, Enhancing educational level of the community with the help of Information and Communication technology, Pertaining to job opportunities and vocational training, Empowering youth with language skills, Identifying the day to day challenges the marginalized communities faced and assists them to overcome them (addresses the unmet needs of communities) and Resolving the conflicts and disputes within the village (facilitate in having responsible and accountable citizens) were identified as the main roles that were played by CR in Sri Lanka to empower the marginalized in the society for a sustainable lifestyle.*

Index Terms: Community Radio, Gandhi, empower, Information and Communication technology, marginalized.

I. INTRODUCTION

Radio is one of the most popular and widely used means of mass communication. In Sri Lanka, radio broadcasting was started in 1923 and it was only about broadcasting recorded music. The regular broadcasting was begun in 1924. Earlier, it was named as Radio SEAC and later renamed as Radio Ceylon in 1949 and it was immensely popular not only in Sri Lanka but also other parts of the Asia too. But, later it was realized that there are many media dark areas in the country and educating and empowering grassroots of the society may not be achieved through existing mainstream media structures in view of their mode of operations. They may not necessarily stand for all the segments of a country's population. In this context, Community radio can be considered important, because its function cannot be substituted by the national, regional or the commercial broadcaster. "The rural mass should be reached effectively and the communication gap between the urban elite oriented mass media and the rural sector has to be bridge – if not eliminated" (David and Valbuena, 1991).

In Gandhian teaching, the village is the basic unit of the ideal social order. He always believed that, if the village perishes, India will perish too. The same can be applied to any country. The best mean of communication to bridge the gap between the educated, self dependent society is using community radio, as a mean of development support communication. "A radio for the whole country is not the need of the hour. A radio is an institution belonging to people; social radios must emerge from village to village" (David, 2012).

When studying the role and the functions of community radio, what Gandhi ji expected from the rural communities to become, it is apparent that the objectives of the community radio too similar in that sense.

According to Gandhi ji, Panchayat's responsibility was to protect and uplift 'untouchables' and other poor people. When it comes to Community radio, the target group was the marginalized people and the ultimate goal was to serve the society to empower the common man. Reaching the marginalized people in the society, finding out the sufferings they have, bringing up the solutions for those problems and opening new paths to the villagers to enhance the quality of their lives by creating self sufficient/ self dependent people were the main objectives of establishing community radio.

Gandhi ji's preferred village habitats to megalopolises and Swadeshi craft to imported technology for the economic well being of the common man. He realized the need for integrated rural development and believed that education, health and vocation should be properly integrated. In fine, Gandhian approach to rural development strives to reconstruct village republics which would be non-violent, self- governed and self-sufficient so far as the basic necessities of rural people are concerned.

According to the community radio handbook by Fraser & Estrada (2001), "Community broadcasting is a non-profit service that is owned and managed by a particular community, usually through a trust, foundation, or association". And they

further mention that "community radio addresses specific needs of community's that are not covered by other public or private media" (Fraser & Estrada, 2001).

Orusolvasagan,et.al (2017) give a definition which is similar to UNESCO definition on community radio that, "it serves the public interest of a particular geographic group or community. It is a medium that can give the marginalized a voice, appeal to societal calm and order, and spread credible, useful information".

Sri Lanka was the first South Asian country to do community broadcasting, starting with Mahaweli community radio (MCR) in 1981. Following Mahaweli community radio, later on Girandurukotte Community radio station (1986), Mahailuppallama Community Radio (1987), Kothmale Community Radio (1989), Pulathisi Rawayaya Community Radio (1995), Uva Community Radio (2003), SARU Community Radio (2005), Dambadeniya Community Radio (2007), and Dambana Community Radio (2012) were established respectively.

But, unfortunately, there is no well functioning pure community radio in Sri Lanka today and it has been locked away as a memory. Still it is worthwhile to find out the potential that community radio had with respect to uplift the rural people who lived in media dark areas in Sri Lanka. The way they facilitate proper representation and participation of people in development, addresses the unmet needs of communities, pertaining to job opportunities and vocational training, facilitate in having responsible and accountable citizens, and new ways of entertainment. This is where community radio has a great potential, particularly because it helps bottom up decision making from each and every community in the decentralized administration. Therefore, community radio facilitates the process of democratic and true nation building.

II. METHODOLOGY

Both the primary and secondary methods were used to collect the needed information for the study. Primary data were collected by conducting In-Depth Interviews (semi structured) and the secondary data were collected through books, magazines, newspapers, dissertations and electronic sources. For an informal research, it is accepted that 20 respondents are often enough (www.audienceialogue.net) for In Depth Interviews. The main reason to select in-depth interviews as the primary data collection method for this study was, it required to deeply investigate the role of CR in Sri Lanka which is not properly functioning today but has become only a memory. Hence, in this study, the researchers purposively selected eight respondents depending on the two community radio eras in Sri Lanka, four each from the first phase of community radio broadcasting and from the second phase community radio broadcasting who has first hand experiences on CR in SL. Those prominent community radio activists shared their experiences, opinions and suggestions in order to fulfill the objectives of the study.

Data analysis was done by using Glaser's Constant Comparative Method. Respondents' responses were compared to each other (using what have been written down in transcripts) & categorized them under different topics (such as proper representation and participation of people in development, addresses the unmet needs of communities, pertaining to job opportunities and vocational training) by using constant Comparative method, in order to find the role of Community radio in Sri Lanka to empower the grassroots.

III. FINDINGS

To fulfill the objectives of the study, the respondents were interviewed and according to the answers they provided, the researcher was able to identify following major factors and incidents as the evidences to understand the role of CR played in empowering marginalized in Sri Lanka during the golden era of CR in Sri Lanka.

01. Reinforcing and facilitating the livelihood of resettled people under Mahaweli Development Scheme

Mahaweli Community Radio was established in 1981 as a result of a large development scheme initiated by the government of Sri Lanka to divert the country's longest river Mahaweli and build a number of dams. "People uprooted from their lands and settled in a totally different geographical area needed development communication to rebuild their lives and that is where MCR came in to existence with the support of UNESCO and DANIDA, the Danish Development Aid Agency" (Seneviratne, 2012). That was the time Mahaweli Development scheme was gearing up to settle the families in Mahaweli areas. Even the officers engaged with Mahaweli Development project was searching for possible solutions to make settled people feel comfortable, and facilitate their livelihood in new lands. Then, they found out that starting a community radio that can address the issues of the newly settled people and find out the solution with the corporative support of the particular community too.

Once, David (2001) mentions in his article that, "Within the period of 1981 -1989, MCR's mobile teams visited 1,500 villages. Survey and studies have revealed the extent of MCR's impact in the region. Girandurukotte community radio and the MCR broadcasts on Anuradhapura regional service are listened to about 90 percent of the local population and are the second most important source of agriculture and health- related information". "There is a very clear agreement amongst the experts that, Mahaweli community radio was used as a potential participatory tool to keep the settlers informed, share experiences, and facilitate the socio economic development for the settlers" (Rasmin,2017).

02. Empowering proper representation and participation of people in development (the decentralized decision making) Raghunath (2012) explains that "the community radio is the radio of, for and by the community". In simple terms, the community drives the radio in every sense, be it production, management or ownership and communication for development was the core of community radio.

Community radio in Sri Lanka became a forum where the community and the development workers can have two way dialogues about the issues related to the particular

community. Local languages and dialects were used when broadcasting programmes. Frequent workshops and events were held to encourage local participation. The station also facilitated discussions on local issues in which opinions and information are exchanged. In this way, the station acted like a meeting point for the community.

Decentralization and power sharing plans have been recognized as essential reforms to support development efforts. But, decentralized administration alone would not bring the desired results unless there are possibilities for each and every community to influence and to take part in the decentralized decision making process. This is where community radio has a great potential, particularly because it helps bottom up decision making from each and every community in the decentralized administration. Therefore, community radio facilitates the process of democratic and true nation building.

03. Fulfilling the need for information, Enhancing educational level of the community with the help of Information and Communication technology

Kothmale Community Radio (1989) was one of the most successful community radio stations in Sri Lanka. They could achieve more miles when comparing with MCR and served its community even with the help of Information and Communication Technology.

A US\$ 50,000 grant by UNESCO helped Kothmale Community Radio to become a part of the World Wide Web in 1998. An internet hub, which includes a local server and five computer terminals, was established in KCR. A web page had been established based on information provided by listeners. Hence, thousands of people have been exposed to the internet directly and indirectly. This information was used for various purposes, such as education, business, livelihood, and recreation.

The Kothmale community radio Internet project was an attempt to extend the benefits of Information and Communication Technology (ICT) to some of the remote

areas of Sri Lanka through the innovative convergence of two media - the radio and the internet. Most of the radio broadcast used information collected by browsing the internet and then this information was discussed with listeners on the air. The internet access points were established in the community enabled direct computer access and respond to the information needs in various groups in the community. An online database of information request was maintained, and a web page in local languages enabled active community participation in the operation of the radio.

The main aim of the e-tuktuk (a trishaw with ICT facilities) was to take new knowledge to the villages, to be able to demonstrate what can be done using new technologies and provided an access point for people who were unable to come to the centre. It was in effect, a mobile Community Multimedia Centre (CMC) which used the radio to give people access to the benefits of newer technologies in the form of the information available via internet.

Sunil Wijesinghe was working as the Station Manager in Kothmale Community radio from 1989 to 2009. In 2004, he started a 'listeners' club' there which consists of teachers, doctors, students, vendors, farmers, house makers, etc almost more than 250 listeners. They issued a magazine also with the fund received from 'Heegos' company.

The community radio station broadcasted a daily 'Radio browsing the internet' programme, and in this programme, the broadcasters supported by resource personnel browsed the internet on air together with their listeners, contextualized information in local language discussed the issues related to the community, and answered the listeners' questions. The radio programme thus contributed to raise awareness about the internet in a participatory manner, the listeners requested the broadcasters to surf the WEB on behalf of them and the programme transmitted

information in response to their requests. This information was explained and contextualized with the help of the studio guests.

04. Pertaining to job opportunities and vocational training

Gandhian approaches explain the importance to the generation of maximum possible employment opportunities in rural areas, especially for the weaker sections of the community so as to enable them to improve their standard of living. In that sense, Kothmale community radio has done an immense job by opening many doors for grassroots where they can find their means of living. A farmer learned new techniques of growing and storing tomatoes. A village baker tried out new recipes that he found on the internet. Teachers had downloaded the lessons and games for teaching English. The information on the radio browsing programme has enabled tea farmers to improve their tea – drying technique.

Uva Community Radio (2003) was planned as an integral part of the Uva area based growth and equity programme implemented by UNDP, Colombo. Producers and volunteers of Uva community radio established a community network of about 200 knowledge Societies (KS). Through these societies, more than 1500 volunteers were able to undergo training on various aspects of broadcasting. Finally, their service was catered for the development of the radio station.

Dambadeniya is well known area where the majority of local farmers focused on dairy products and development as means of livelihood. Dambadeniya community radio (2007) took the responsibility to enable all interested local dairy farmers who had burning issues regarding the dairy industry. The youth, women and school going children of Dambadeniya export village took the initiative to establish Dambadeniya Community Radio. So, it enabled a broader set of people to benefit and improve their skills in dairy products by giving good enough knowledge to the villagers.

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05. Empowering the youth with language skills

Easy and free access to information has been effectively used by community members for business, educational, recreational and other purposes. More than 30 web pages have been created by community youths under Kothmale Community radio. In addition, an ‘internet club’ and a ‘listeners’ club’ have been formed. Kothmale community radio station had become an integral part of the community, with people actively participating in interactive programmes, contributing compact disks with songs to the station, and using the information aired on various programmes to upgrade their businesses or learn more skills.

In KCR, broadcasting didn’t limit only to broadcasting in Sinhala Language but also they broadcasted in Tamil and English languages as well. Even foreigners from Australia, Nepal, and America joined KCR and voluntarily contributed their service for English broadcasting programmes. Not only presenting programmes, but also they conducted English classes for those who work there in KCR. “To disseminate information a four stroke auto rickshaw (e - tuktuk) has been converted by local mechanics and out fitted with a mobile radio station, speakers, internet ready lap top computer, a power supply unit, a digital camera, a scanner, a CDMA phone and a battery operated printer, so that the local people can make full use of the mobile studio’s capabilities, when it visits their community” (Carter, 2009).

“The biggest success stories have occurred with local youth who have eagerly embraced the new technology. Many through volunteering at the station were able to create their own web sites and to teach others how to use Kothmale computers. Another benefit has been the dissemination of human rights information to local communities through association with human rights activists and professionals at Colombo University whose human rights centre funds the programme, and

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development of programme which educate women about health and home related issues of concern to them” (Carter, 2009).

With the vision of ‘an independent voice devoid of controls, for the voiceless, diverse communities’, “SARU” community radio came into existence in 2005 under the Gemidiriya Community Development and Livelihood Improvement Project funded by the World Bank, launched in Polonnaruwa, which later on covered more than 1000 villagers. “During the project implementation in 1036 villages in seven districts, the project observed that, knowledge, attitudinal change, skills, and practice are vital factors for employment of poor communities, specially women and youth. A remote rural community made a strong and committed effort from 2005 onwards to make the best use of the opportunity accorded to them with the above input to go through the whole learning process and engaged themselves in activities including community awareness creation, fund raising, content development, studio establishment etc.

06. Identifying the day to day challenges the marginalized communities faced and assist them to overcome those problems (addresses the unmet needs of communities)

At the time of Mahaweli community radio, “on a visit to a Mahaweli settlement in the North Central region, Sunil Wijesinghe (Station Manager at KCR) discovered that, many children did not have birth certificates. This means that they were not going to be claim their land from their parents when the time come. And also he discovered that many of the couples were not legally married. After discussing with the authorities and village elders, Sunil organized a mass wedding ceremony and surprisingly, even grandfathers and grand mothers came forth to solemnize their marriages. And long after this programme, the Mahaweli authority continued to receive requests from villages to solemnize weddings” (David, 2008).

In many of the regions, banking and loans are critical to the life of the villagers. But many farmers often default on their loans and stop all contacts with the bank. This was non productive for it, also preempts all future loans and banking relations. Harishchandra Perera, was able to convince farmers in Mahaweli system B to revisit banks after having been unable to pay the loans back due to low crop production. With the support of the Mahaweli programmes, a new dialogue was fostered between farmers and bank officials.

Another instance was Kothmale community radio used e – tuktuk to conduct community researches to find out the burning issues the community faced and to find out solutions for them. Once KCR helped to purchase a water tank for a Tamil tea state line houses community who were suffering without having access to enough water.

07. Resolving the conflicts and disputes within the village (facilitate in having responsible and accountable citizens)
- Community radio is the most accessible and the most suitable medium for a rural community, as it doesn’t require literacy to access it like print media require for. Most importantly, community radio is a kind of binding force of the community for much better livelihood.

Pulathisi Rawayya Community radio was established in 1995 under the control of SLBC especially to build peace in the remote North Central and Eastern regions as people of those areas were suffering a lot with the ethnic war.

During a direct interview with Prof. Wanigasundara (2018), he mentions that “There are some people in Jaffna district who live like they are isolated. They do not have a proper knowledge about the socio cultural aspect of the rest parts of Sri Lanka. Their voices, opinions, likes and dislikes, problems are unheard. For a community like them, community radio is the answer”.

It is obvious that the worth of the presence of Community radio, the radio companion of the marginalized of the Sri

Lanka is all time appreciable when considering its capacity to uplift the grassroots' lives, to inform, to educate and to entertain them, show them the path, create the cohesion and community consciousness in order to strengthen the particular community.

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Development Of Physic Learning Instruments Using Cooperative Learning Model STAD Type With ARCS Model To Improve Student's Creative Thinking Skills In Senior High School

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Abstract- This research aims to developing of physic learning instruments using cooperative learning model STAD type with ARCS model to improve student's creative thinking skills in senior high school. This research is developmental research aimed at developing learning instruments that will then be implemented in class. The research design used in the study uses a 4-D development model. Learning instruments developed include syllabus, lesson plans (RPP), student handouts, student worksheets (LKS), creative thinking assessment instruments. The sample of this research is a physics learning instruments using cooperative learning model STAD type with ARCS model to improve student's creative thinking skills in senior high school on static fluid material taught to 90 students class of X in the Antartika High School Sidoarjo academic year 2018/2019 who have never received learning using cooperative learning models STAD type with ARCS model. This research consists of 2 stages, namely the first stage of developing learning instruments, and the second stage is testing the learning instruments. Data collection techniques from this research were observation, tests, and questionnaire. Based on the results of research and discussion. Physic learning instruments using cooperative learning model type STAD with ARCS model developed has met the requirements of validity, practicality, and effectiveness, so it is appropriate to be used to improve student's creative thinking skills.

Index Terms- Development of Physic Learning Instruments, Cooperative Learning Model STAD Type, ARCS Model, Student's Creative Thinking Skills

I. INTRODUCTION

Physics is a part of science that deals with phenomena and behavior nature, which is observed by humans. The curious nature of students needs to be stimulated, grown and maintained as well as possible. Physics is science experiments, so by conducting experiments students not only understand and mastering concepts, theories, principles, and physical laws, but students also apply scientific methods.

The teacher has more role as a facilitator and motivator in learning. The main principle of active learning is the mental-intellectual and emotional involvement of students in each learning process which is by the view of cognitive learning theory. Then due future challenges require more developed learning creative thinking skills included in High Order Thinking (HOT). Creative thinking is one of the human intellectual abilities very important because it is included in the ability to solve problems [1]. Creative thinking is easily realized in the learning environment which directly provides opportunities for students to think openly and flexible without fear or shame, so that related to student activities. Student learning activities so far tend is individualistic, meaning students are trying to understand and solve the problem is based on the perspective and the results of one's thinking. That matter leads to student learning gaps marked by absence interactions between individuals. Students in learning less get input knowledge from more capable friends. This situation is what causing difficulties and even failure of students, even more so for low ability students.

Based on the results of interviews with physics teachers at Antarctic Senior High School Sidoarjo, it is known that there are no teachers who do learning and assessment for creative thinking skills. The results of the pre-research study were tested creative thinking skills in students known to 10% of students complete in creative thinking skills. The low percentage of students completeness in the test creative thinking skills are caused by several factors. The teacher said the absence of adequate media facilities and the complexity of the assessment that must be done is an obstacle experienced. Arrangement of learning instruments by practicing creative thinking skills will make students accustomed to develop or find original, authentic, and original ideas constructive which are directly related to the concept view and emphasizing aspects of intuitive and rational thinking [2]. Through this learning, students realize the importance of physics in mastery of science and technology in everyday life.

Students need to develop creative thinking as well solving problems related to student life [3], so we need a learning model that encourages students to be good and creative thinkers, who can provide many alternative answers to a problem. The learning environment

that is formed must be facilitate discussion, encourage students to express their opinions and creative ideas. Such learning situations can be realized through cooperative learning.

Piaget and Vygotsky emphasize the social nature of learning, both of which suggest using study groups with the ability of diverse group members to work on power change in the understanding of learning [4]. Expected learning atmosphere as above will we get in the cooperative learning model. Cooperative learning model there are various models of approach but in this case can develop creative thinking, namely the Student Teams Achievement Division (STAD) is cooperative learning in which heterogeneous teams interact with each other help one another, learn by using various methods cooperative learning and quiz procedure. Theories that support the cooperative learning model STAD type includes constructivist theory, Piaget's cognitive theory development, and Vygotsky's social theory. According to Piaget, optimal education requires experience challenging for students so that the process of assimilation and accommodation can be produce intellectual growth. The cooperative learning model STAD type can influence the creative thinking skills of class students XI High Schools in Wajo Regency, South Sulawesi, with the category "medium", [5] about the profile of creative thinking abilities and cognitive learning achievement in middle school students with cooperative learning STAD type concluded that the results student's learning and creative thinking skills have increased considerably. The effect of cooperative models STAD type with the SETS approach concluded that there was a significant effect on critical thinking skills and learning achievement [6] and the effect of the STAD cooperative learning model and Think Pair Share (TPS) concluded that the STAD type cooperative learning model can improve creative thinking skills better than models Think Pair Share (TPS) learning [7].

Meanwhile, to optimize and become support in teaching cooperative models STAD type then the ARCS model to increase student motivation which is aligned with the steps cooperative learning STAD type. ARCS model can improve student's creative and critical thinking skills with the category "medium" [8]. ARCS motivation strategies on inquiry models can improve student's higher-order thinking skills with the category "medium" [9] and regarding the application of motivational strategies ARCS concludes that managing ARCS motivational strategies improves learning achievement and student learning activities [10]. The development of teaching materials on integrity is done by integrating overall competence. Static fluid material was used in this study because the material has a concept of physics that is quite broad and can explain the phenomena that occur around such as a hydraulic system, submarine work systems and so on. It is expected that students can make discoveries or new ways that are the result of creative thinking skills.

Based on the above description the researcher intends to develop cooperative learning model STAD type with ARCS model to improve student's creative thinking skills on Static Fluid Material in Class X High School and apply it to physics as a solution the implementation of learning in the Antarctic High School Sidoarjo

II. EXPERIMENTAL METHOD

2.1 General Background of Research

This research is developmental research aimed at developing learning instruments that will then be implemented in class. The research design used in the study uses a 4-D development model. Learning instruments developed include syllabus, lesson plans (RPP), student handouts, student worksheets (LKS), creative thinking assessment instruments. This research was conducted at the Antartika High School Sidoarjo in the Even Semester, academic year 2018/2019. The school was chosen as a place of research because the school was open to efforts to improve the quality of learning, and the availability of adequate supporting facilities and infrastructure.

2.2 Sample of Research

The sample of this research is a physics learning instruments using cooperative learning model STAD type with ARCS model to improve student's creative thinking skills in senior high school on static fluid material taught to 90 students class of X in the Antartika High School Sidoarjo academic year 2018/2019 who have never received learning using cooperative learning models STAD type with ARCS model.

2.3 Instrument and Procedures

This research consists of 2 stages, namely the first stage of developing learning instruments, and the second stage is testing the learning instruments class of X in the Antartika High School Sidoarjo academic year 2018/2019.

2.4 Data Analysis

a. To find out the validity of the learning instruments, the data analysis of the learning instruments validation was done in a qualitative descriptive manner which included: lesson plans, student worksheets, student books, and creative thinking instruments. The data obtained were analyzed using the average score of each aspect. The scoring results are described as follows.

1.00 ≤ SVP ≤ 1.50: Not suitable and cannot be used yet.

1.51 ≤ SVP ≤ 2.50: Not appropriate and can be used with many revisions.

2.51 ≤ SVP ≤ 3.50: Feasible and can be used with minor revisions.

3.51 ≤ SVP ≤ 4.00: Very feasible and used without revision [11]

The instrument's reliability level is calculated by the formula:

$$R = \left(1 - \frac{A - B}{A + B}\right) \times 100\%$$

Information:

R = reliability

A = frequency aspect which gives a high frequency

B = frequency aspect which gives a low frequency

The reliable instrument if the reliability coefficient ≥ 75%

- 1) Validity of RPP. Data analysis of the validity of the RPP components was carried out with a qualitative descriptive method by averaging the scores of each component. This validity is carried out by validators who are competent in their fields.
- 2) Validity of BAS. The validity of BAS was analyzed descriptively qualitatively which included the feasibility of the content, linguistics, and presentation carried out by the validator, then the scores given were averaged in the same way as the analysis of the validity of the RPP.
- 3) Validity of LKS. The validity of the worksheet was analyzed descriptively qualitatively covering the format, language, and content carried out by the validator, which was then given a score and a feasibility category.
- 4) The validity of the Creative Thinking Skills Test. The validity of the creative thinking skills test was analyzed descriptively qualitatively. The results of the analysis of creative thinking skills test data are elaborated with qualitative descriptive which includes the validation of the questions, the language, and writing of the questions, and the conclusions made by the validator which are then given a score and a feasibility category.
- 5) BAS Readability. Validity data obtained were analyzed by descriptive qualitative. The results of the analysis of the readability of students' textbooks are elaborated with descriptive qualitative. The calculation of readability uses the following formula.

$$K_b = \frac{k}{\Sigma k} \times 100\%$$

Information:

K_B = readability level

k = frequency of words that can be read

Σk = the total number of words that must be read

The calculation result is more than 75%, then the text category is easy or has high readability, if the result is between 20% - 75%, then the text category is medium or reads moderately, and if the result is less than 20% then the text category is difficult or has low readability.

- b. To find out the practicality of a static fluid learning instrument developed through a cooperative model with the ARCS approach, the learning achievement data is analyzed descriptively with qualitative and inferential statistics as follows.

- 1) Learnability

Analysis of the feasibility of learning conducted by two observers who have been trained to understand the observation sheet correctly, then the feasibility data is processed in quantitative descriptive statistics. The assessment is done by putting a checkmark (√) in the performance column which consists of "yes" or "no" choices and in the assessment column which consists of 4 criteria, namely: very good, good, not good, and not good. Data analysis techniques can be calculated using the following equation.

$$P = \frac{\Sigma K}{\Sigma N} \times 100\%$$

Information:

P = percentage of feasibility

ΣK = number of aspects implemented

ΣN = the sum of all aspects experienced [12]

Implementation Criteria: 0% ≤ P ≤ 24%: not implemented, 25% ≤ P ≤ 49%: less implemented, 50% ≤ P ≤ 74%: well done, 75% ≤ P ≤ 100%: very well implemented

- c. To find out the effectiveness of static fluid learning tools developed through a cooperative model with the ARCS model, analysis of the effectiveness of learning instruments is used as follows.

- 1) Creative Thinking Skills Test

Student's creative thinking skills test data were analyzed using qualitative descriptive analysis to obtain the value of student's creative thinking skills. The results of the analysis of creative thinking skills test data are elaborated with descriptive qualitative. The value of students' creative thinking skills is obtained by the formula:

$$\text{creative thinking skill} = \frac{\text{total score obtained}}{\text{total score}} \times 100\%$$

Creative thinking skill criteria: 81,6% - 100% = very creative, 61,2% - 81,5% = creative, 40,8% - 61,1% = quite creative, 20,4% - 40,7% = less creative, 0,0% - 20,3% = not creative [13]

- a) Homogeneity Test

Homogeneity is used to test the effect of both homogeneous data by comparing the two variations, while this study aims to examine the effect of data obtained by homogeneous or heterogeneous variance. To test homogeneity can be calculated using SPSS 22.0 for Windows, with the following criteria:

- The value of sig. or the significance or probability value <0.05 then the data have non-homogeneous variants.
- The value of sig. or significance or probability value > 0.05 then the data has a homogeneous variant.

- b) Normality Test

The normality test in this study is used to test the effect of data that is used as research material with normal distribution or not. Calculation of normality tests can use the Kolmogorov Smirnov test with the help of SPSS 22.0 for Windows with the following criteria:

- The value of sig. or the significance or probability value <0.05 then the data are not normally distributed.
- The value of sig. or significance or probability value > 0.05, then the data are normally distributed.

- c) Hypothesis Test

After the prerequisite tests for homogeneity and normality, the hypothesis test is then performed. The hypothesis test used is

the Two Way Anova parametric statistics, the analysis often referred to as the multiple ANOVA is a parametric statistical technique used to test differences between data groups of two or more independent variables. In this study, there are 2 independent variables, namely pretest, and posttest and class groups, and then one dependent variable is the results of the creative thinking skills test. ANOVA Two Path Test is used using SPSS 22.0 for Windows. After analysis comparing the significant values obtained, if ≤ 0.05 , it can be concluded that there is an influence. In addition to SPSS 22.0 for Windows, calculating ANOVA two paths can be done manually. The steps to determine the price of two-way ANOVA are as follows:

- Determine the hypothesis
 1. Ho: There is no effect of the cooperative learning model with the ARCS model on the creative thinking skills of high school students.
H1: there is an influence of the cooperative learning model with the ARCS approach on the creative thinking skills of high school students.
 2. Ho: there is no class effect on high school student's creative thinking skills.
H1: there is a class effect on high school student's creative thinking skills.
 3. Ho: there is no effect of the cooperative learning model with the ARCS and classroom approaches on the creative thinking skills of high school students.
H1: there is an influence of the cooperative learning model with the ARCS and classroom approaches on the creative thinking skills of high school students.
- Calculate the total number of squares (JKt), between A (JKa), between B (JKb), interaction A x B (JKab) and within the JKd group.
- Calculate the degree of total freedom (dbt), between A (dba), between B (dbb) interactions A x B (dbab).
- Calculate the average of the squares between A (Rka), between B (Rkb), interaction A x B (Rkab), and in groups (Rkd).
- Calculate the ratio of Fa, Fb and Fab
- Test the significance of all prices F
If $F_{count} \geq F_{table}$ (significant) with the numerator db and the denominator db that has been obtained in the calculation and if the significance is $\leq 5\%$ then H1 is accepted and reject Ho.

d) N-gain

After ascertaining that the learning tools used have a positive impact on the results of students' creative thinking skills through t-test then the data is analyzed with N-Gain. The use of this technique is used to find out the magnitude of the increase in creative thinking skills of each student which is indicated by the value of G (normalized gain) and with the following formula:

$$\langle g \rangle = \frac{S_{post} - S_{pre}}{S_{max} - S_{pre}}$$

With

- <g> = gain score
- S_{post} = post-test score
- S_{pre} = pre-test score
- S_{max} = maximum score

2) Student Response Questionnaire.

Student responses were analyzed descriptively with presentations using the formula for calculating student responses as follows.

$$P = \frac{\sum K}{\sum N} \times 100\%$$

Information:

- P = Percentage score of student responses
- ΣK = Number of students who chose answers
- ΣN = Number of all students

III. RESULT AND DISCUSSION

Validated learning instruments consist of lesson plans, handouts, worksheets, and learning achievement tests. The results of the RPP validation compiled have a very valid category and can be used with a little revision (average score 3.72). The reliability of the RPP is 96.22%, so the results of the RPP validation prepared can be used. The aspects assessed in the RPP include identity, goals, methods, facilities and learning resources, learning steps, evaluation, and readability. However, for the sake of perfection of the RPP, there is little advice from the validator. In Table 4.2, the first suggestion given is that there is no reference explanation from the K-13 based books, practicum activities are dominated by teachers, and writing numbering of Indicators is adjusted to Basic Competence (KD). The learning process applied is cooperative learning models with the ARCS approach. The material presented is Static Fluid. The Learning Implementation Plan (RPP) compiled by researchers is used as a guide for carrying out the learning process in the classroom.

The worksheet validation results explain that have a very valid category and can be used with little revision (average score of 3.77) with the reliability of 98.12%. The aspects assessed from the worksheet include the worksheet format, content suitability, and language. From all aspects assessed, the average score was very valid. However, for the sake of perfection worksheets, from the validator, there is a little suggestion that is the addition of Working Drawings on Worksheet 02. After the worksheet is corrected by the validator's suggestion, then the learning instrument LKS can be used in the learning process. Student Activity Sheet (LKS) is a guide for students to make

observations, practicums, clarify understanding, discover and apply existing concepts done in groups or independently. The use of worksheets is also expected to facilitate students in the learning process, especially to train students' creative thinking abilities.

The results of the validation of the Handouts for students show that have a valid category and can be used with little revision (average score of 3.65) with the reliability of 92.73%. The aspects assessed from the Handout for students include the organization of sub-concepts, the contents, characteristics, and the elaboration of concepts. From all aspects that were judged to obtain a valid average score results. However, for the sake of the perfection of the student book, from the validator there is little suggestion that the information in the picture is improved and as well as the reference writing the equation formula. After the Handout for students is corrected by the validator's suggestion, the student's learning kit can be used in the learning process.

The results of the validation of the learning outcomes test in Table 4.5 show that the results of the validation of the test results of the learning achievement compiled have very valid category but have moderate reliability. This problem can be used with revisions so that it is feasible to use in the learning process. Learning outcomes test consists of pre-test questions, and post-test questions that are made concerning the basic competencies to be achieved then elaborated into indicators of achievement of learning achievement and are arranged based on a grid of questions complete with key answers. Suggestions given by the validator include: learning objectives in pre-test and post-test, revision of answers to questions in pre-test and post-test number 6, and learning objectives are too many, it is better to be chosen so that they are not too many. After the learning achievement test is improved according to the validator's suggestion, the learning achievement test can be used in the learning process.

Based on that, in general, the implementation of the RPP has an average score of 3.8 which has a very good category. The reliability of RPP implementation is 88%, which means that RPP implementation is categorized as very good because the reliability value is $\geq 75\%$ so that it can be used in the learning process. This shows that in the implementation of physics learning using cooperative learning models with the ARCS approach can be categorized very well. Cooperative learning model STAD type consists of the following learning activity cycles 1) Class presentations, 2) Group activities, 3) Tests / Discussions, 4) Calculations of individual development scores, and 5) group awards. Then the cycle is arranged by the researcher to adjust to the ARCS model, including the Preliminary Phase ie the teacher conveys the learning objectives and related learning material, the Core Activity Phase ie the teacher gives a pretest which is then used as a guideline to divide the group heterogeneously and work on the worksheet and then the Concluding Stage The teacher conducts group discussions, provides posttests and rewards for groups that have a high increase in group scores. In class X IPA 1, the preliminary stage in learning based on the ARCS model has an average score of 3.7, whereas in class X IPA 2 and X IPA 3, respectively indicate an average score of 3.7 and 3.8 which have categories very good. The preliminary stage in learning has an average score of 3.8 with a very good category. This means that the teacher has implemented the learning well including the delivery of apperception and motivation, the delivery of goals, and advance organizers using physical phenomena around students so that the impact on student enthusiasm when participating in learning. Advance organizer with physical phenomena around students conducted by the teacher is proven to stimulate student knowledge related to the material to be taught. The core activities of class X IPA 2 get an average score of 3.6, whereas in class X IPA 3 and X IPS 2, respectively get an average score of 3.8 and 3.7 with a very good category to get an average score averaged 3.7 in the excellent category. At the first meeting, students are still confused with practicum activities because they have never participated in learning with practicum so the teacher must guide slowly the stages of practicum to students. In general, the core activities went well. The closing stage gets a very good average score while time management gets a good average score. Time management at the first meeting is a bit disrupted because the teacher has to adjust the time of one lesson that is not by the learning design. Students and teachers seem enthusiastic about implementing learning. The teacher can liven up the classroom atmosphere, so the class becomes fun and general the implementation of RPP have very good category.

Student's creative thinking abilities are measured by doing a creativity test. The questions of creative thinking are in the pre-test and post-test questions. The problem of creative thinking is 5 questions. Each question contains all four indicators of creative thinking ability measured (fluency, flexibility, originality, and elaboration). Creative thinking is a habit of the mind that is trained by paying attention to intuition, animating the imagination, expressing new possibilities, opening amazing perspectives, and generating unexpected ideas (Johnson, 2010). Based on this opinion, the ability to think creatively needs to be trained so that students can use their creative abilities to solve a problem with many possible solutions. The results of the creative thinking test of students of X IPA 1 average pre-test of 28.23 with less creative category, X IPA 2 average of pre-test of 20.88 with less creative category, and X IPA 3 pre-test average of 20.88 with less creative categories. This is because, most students have not been able to come up with diverse ideas, so many students find it difficult. After participating in cooperative learning models with the ARCS model and trained in creative thinking skills, X IPA 1 average post-test of 82.56 with creative categories, X IPA 2 average post-test of 84.35 with creative categories and X IPA 3 average post-test average of 81.77 with the creative category. This is because students have started to get used to working creatively, fluently in issuing ideas, issuing lots of correct ideas, and being able to design practical designs well. The results of the achievement indicators of creative thinking ability can be seen in Table 4.8, the highest increase seen in fluency indicators with an increased score of 0.91 (high) in Class X IPA 2 and the lowest in Class X IPA 1 with an increased score of 0.88 (high). This is because students start fluently in writing ideas in answering the given problems. In learning cooperative models with the ARCS model, students are trained to smoothly relate a concept to the phenomena around it, so that these abilities can be used when solving a problem. The flexibility indicator increased by 0.80 (high) in class X IPA 2 and the lowest in class X IPA 1 increased by 0.74 (high). This is because, during learning of the cooperative model with the ARCS approach, students are trained to develop many ideas with different points of view in answering a problem. Indicator of authenticity (originality) increased by 0.76 (high) in class X IPA 2 and the lowest in class X IPA 1 increased by 0.72 (high). Despite having a moderate increase, students are considered to still less able to come up with original ideas when questioning is done directly, but in writing in the post-test students can come up with unusual ideas. The elaboration indicator increased by 0.75 (high) in class X IPA 2 and the lowest in class X IPA 1 with X IPA 3 an increase of 0.70 (high). This can be seen from the students' answers that began in detail by giving specific details on each idea given. In cooperative learning models with the ARCS model, students are also trained to detail the functions and

usefulness of practical tools and materials. In general, all indicators of creative thinking ability have increased in the medium category.

Description of the average value between the test scores of creative thinking skills in the pre-test and post-test of Natural Sciences X-1, Natural Sciences X-2 and Natural Sciences X-3, tested by SPSS using the two way ANOVA test, first the data was tested on the level of normality of data above $\text{sig} > 0.05$, it can be said that the pretest and posttest values are normally distributed, also using the homogeneity test that the value data is above the sig value. > 0.05 then all the data tested are homogeneous, so it can be said that the pretest and posttest values have met the prerequisite tests, namely the normality test and the homogeneity test. After the two-way ANOVA test is obtained: 1) Tests of Between-subjects Effects show the learning model with a significant value Corrected Learning model is 0,000, then 0,000 < 0.05 , H_0 is rejected. So it is concluded that there is an influence of cooperative learning model learning model with the ARCS model to improve student's creative thinking skills in senior high school. 2) At the PROPOS value the significance level of the pre and post-test group level was 0,000, then 0,000 < 0.05 , H_0 was rejected. So it was concluded that there was an influence of the level of pre-test and post-test scores on the creative thinking skills of high school students. 3) In the CLASS Values, Inter-Level Class X IPA 1, X IPA 2 and X IPA 3 is the significance value of cooperative learning model STAD type with ARCS model is 0.639, then 0.639 > 0.05 , H_1 is rejected. So it was concluded there was no difference in value (there was a similarity in value) the effect of cooperative learning model with the ARCS model and the level of Science Class X of the Antarctic High School Sidoarjo on the subject of Static Fluid. These results support Bruner's theory which suggests that students should learn through active participation with concepts and principles so that they gain experience and conduct experiments that allow them to find their principles.

Student learning achievement are measured by conducting a test of learning achievement. Learning achievement tests are given at the time of the pre-test and post-test. The learning achievement test consists of 10 multiple choice questions and 5 descriptive questions which include creative thinking questions. In class X IPA 1 shows the results of the pre-test on average of 29.17 and post-test of 81.9 while class X of IPA 2 shows the results of the pre-test on average of 35.67 and post-test of 86.73 then class X Science 3 shows the results of the pre-test on average of 29.33 and post-test of 83.43 with the number of students who did not complete in class X Science 1 as many as 1 student, X science 2 as many as 4 students, and X Science 3 as many as 3 students. Based on these results student learning outcomes have increased with an average gain value of 0.74 which is categorized high for the three classes. The concept of static fluid is the initial material given in class X although previously it was also given during middle school, so students still have difficulty in remembering the material to answer the questions given in the pre-test. Before being given cooperative learning models with the ARCS model, students have indeed not been given exercises of creative thinking questions, so when given creative thinking questions, students are still confused in answering the questions given. The cooperative learning model with the applied ARCS model can help students in understanding concepts and practicing creative thinking skills so that when working on a post-test, students can smoothly answer the questions given. Improving student learning achievement is also supported by the practice questions in the Handout for students. Students are also challenged to work on creative questions so that they are increasingly trained in developing student's creative thinking abilities which have an impact on increasing learning achievement. Based on the description of student learning achievement it can be concluded that cooperative learning models with the ARCS model can improve student learning achievement.

The skill aspect is related to student's motor skills. Aspects of skills are measured when students do practical activities. The assessment instrument was in the form of student skills observation sheets which included; prepare tools and materials, assemble sets of practicum, do a practicum, record the results of practicum, answer worksheets, and tidy up practicum tools. Based on Table 4.10, the average score of the aspects of the skills of students in class X IPA 1 is the average A- predicate, X IPA 2 is the average A- and X IPA 3 average A-predicate. This is because students do not often do practical activities before, so in the first practicum students are still confused with the steps in the worksheet. Skills in using tools also must still be guided by the teacher. The skills of students in the second and third practicum have experienced development. Seen when assembling the experiment set, students can immediately apply it after reading the worksheet. With practical activities, students can also practice their creative thinking skills in problem-solving.

Student responses are responses given by students after participating in learning. Student responses were measured using a student questionnaire response instrument. Students are asked to fill in a questionnaire containing opinions and assessments of the implementation of learning and its supporting components which include; interest in the learning component, the novelty of the learning component, difficulties in learning, and the learning methods applied.

Based on Table 4.13, overall the learning that has been carried out has received positive responses with a percentage of 92.14%. This can also be seen from the enthusiasm of students in the following learning by Ausubel theory learning must build understanding in its cognitive structure, and learning must be a meaningful part of solving life problems (Nur, 2008). From the aspect of student interest, it was obtained X IPA 1 of 93.28%, X IPA 2 of 93.75% and X IPA 3 of 95.97% of students expressed interest in the implementation of learning and its supporting components. Students are interested in the Handouts for students created by researchers because they are easy to understand and have many creative questions in them.

In the aspect of the novelty of learning, the students' response X IPA 1 is 93.63%, X IPA 2 is 93.75% and X IPA 3 is 96.77% stating that the learning that has been done is new, both in terms of learning and from its supporting components. Practicum activities and teacher teaching methods are considered as something new for students because they have never been given such learning.

Student responses to the aspects of the difficulty of students X Natural Sciences 1 by 89.71%, X Natural Sciences 2 by 89.38% and X Natural Sciences 3 by 89.68% of students stated not difficult. Students still find it difficult to work on count problems in class X IPA 2 (10.62%). This can be seen in the test results given, only a few students who can do the calculation problems correctly. Then students should also need to be taught count problems that are easily understood by students.

In the aspect of learning methods applied, X IPA 1 of 93.53%, X IPA 2 of 93.30% and X IPA 3 of 91.61% of students said they liked the learning done. Students prefer to be explained by the teacher directly than to find themselves. Students still find it difficult to find their concepts, so they still need to be trained continuously about the method of discovery. Students also prefer to be given creative problem solving because it can train students' creative thinking abilities. Overall, students responded positively to the learning of cooperative physics

models with the ARCS approach.

IV. CONCLUSION

Based on observations of the data obtained, calculation analysis and discussion of the results of research on the development of instruments and the application of cooperative learning models with the ARCS approach found the following matters: 1) Learning instruments developed include lesson plans, handouts for students, student worksheets, and learning achievement tests that are of good quality so that they are valid as a learning tool with slight revisions in the teaching and learning process. 2) The implementation of the physics learning process on static fluid material has been carried out with a very good category. 3) Description of the effectiveness of the application of cooperative learning models with the ARCS model. This is seen from several aspects, namely: a) Student learning achievement X IPA 1 has increased with an average gain value that is categorized high, X IPA 2 has increased with an average gain value categorized high and X IPA 3 has increased with an average gain value that is categorized high. b) The average score of the aspect of skills obtained by students is the average score of the aspect of skills of students in class X IPA 1, the average grade of A-, X IPA 2, the average value of A- and X IPA 3, the average grade of A-. c) Students creative thinking test X IPA 1 average pre-test category less creative and post-test creative category while students creative thinking test X IPA 2 average pre-test category less creative and post-test creative category then test creative thinking student X IPA 3 average pre-test category is less creative and post-test is a creative category. d) There is an influence of the cooperative learning model with the ARCS model to improve student's creative thinking skills according to the Test of Between-subject Effect. e) There is no difference in values (there are similarities in values) the effect of the cooperative learning model with the ARCS model on the third grade of high school by the Two Ways Anova results. f) Student responses to learning cooperative models with the ARCS model show a positive response. 4) Description of the obstacles encountered in the implementation of learning, among others; allocation of learning time, students' initial knowledge of the material, and constraints during practicum. These obstacles can be overcome by the teacher by conducting guidance, supervision, and control of each activity carried out by students.

Physics learning instruments using cooperative learning model type STAD with ARCS model developed has met the requirements of validity, practicality, and effectiveness, so it is appropriate to be used to improve student's creative thinking skills.

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Research on humanoid robot grasp object

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Abstract- Robot technology has become one of the most core technologies in the competition of overall national strength among countries in the world. Robot Grasping Technology, as one of the most important technologies in the field of Robotics, is the most basic technology. Different from industrial robots, the automatic grasping ability of humanoid robots is mainly affected by the environment and synergistic sensor. What more, the diversity and randomness environment also put forward higher requirements for the sensory system of humanoid robot. In fact, in the real experiments on NAO, the monocular vision is difficult to gather the depth information of the environment; and the overlapping field of view of the binocular vision is small, which limits the grasping scope of NAO. Therefore, the paper presented a solution that robots perceive the outside world through the Kinect sensor instead of the camera, and then do a research on the kinematics of the robot, the identification and localization of the target, motion path planning of the manipulator and the real-time object-grasping operation. The main contents of this article are as follows.

(1) According to the robot kinematics, the relevant theoretical knowledge was introduced, and the mathematical model of NAO's arms based on D-H and kinematics forward equations were established, then the inverse kinematics equation was solved by using analytical method, which provides a foundation for the realization of NAO robot grasping target.

(2) For the realization of high-precision target localization of the robot. This paper presented a design scheme of humanoid robot target localization based on Kinect. Firstly, carrying out the image processing of the scene information from Kinect to get the coordinates of the target center point; then the coordinate systems for the Kinect and the robot were established, the Bursa coordinate transformation model between Kinect and the robot was constructed, and the unknown parameters with the model were solved by the linear total least squares algorithm (LTLS) algorithm. After that, to realize the robot target localization, transforming the target center coordinates of Kinect to the robot coordinate system through the model. At last, the experiments were carried out on the humanoid robot NAO, which shown that the proposed target localization is reasonable and feasible; simultaneously, NAO robot can locate the object in real time, reliably with the method, which satisfied the localization accuracy required with the robot to grab the object. It is also more accurate than the monocular vision of NAO robot.

(3) In order to make robots quickly and accurately grasp the object, after analyzing the working space of the robot, the iteration method and the geometric method were used to calculate the motion reachable space of NAO's arms Aiming at the characteristics of multi-joints and high-dimensional space of the NAO robot,

this paper planned the motion path of the robot arm via the improved Rapidly-exploring Random Tree (RRT* algorithm), which introduced the grid search method and the bidirectional expansion strategy into the original RRT* algorithm. The experimental results show that this method not only preserves the characteristics of RRT*, but also improves the efficiency of the path planning.

(4) Under the constraints with obstacles and without obstacle, through the construction of the overall robot self-crawling system, by combining the above (1), (2), and (3) expounded methods, then achieving the goal of the robot autonomy grasps diverse objects in different environments. At the same time, the experiments verify the correctness of the theory used in this paper.

Mention the abstract for the article. An abstract is a brief summary of a research article, thesis, review, conference proceeding or any in-depth analysis of a particular subject or discipline, and is often used to help the reader quickly ascertain the paper's purpose. When used, an abstract always appears at the beginning of a manuscript, acting as the point-of-entry for any given scientific paper or patent application.

Index Terms- Kinect sensor; Target recognition and localization; Motion path planning; the robot NAO; Grasping target

I. Introduction

At present the world is at the confluence of the industrial revolution and the new technological revolution. Continuous innovation has been promoted the vigorous development of robotics technology. Robotics technology is now one of the important technical pillars for development. In order to care for the elder people, for the daily lives of people with disabilities and the liberation for more labor the study of service robots with arms and related technologies is important. Humanoid robot is a kind of service robot that imitates humans in appearance, behavior and language design. The head, arm, torso, and foot are based on machinery and manufacturing technology, and are integrated with communications, control, and computers. With a strong discipline and flexibility, it is suitable for working with humans or replacing human work. Among them, grabbing objects is an indispensable capability for

humanoid robots and is also the most important function of robots. The research of humanoid robots for grasping objects not only includes machine vision technology, but also involves control theory and computers. There are many aspects such as graphics, geometric topology and basic mathematics, so it is challenging to achieve this operational task. further research on humanoid robot technology has extremely important practical significance

II. ROBOT KINEMATICS

A. Computing Forward kinematics

$${}^nT_0 = {}^1T_0 \cdot {}^2T_1 \cdot {}^3T_2 \cdots {}^nT_{n-1} = \begin{pmatrix} n_x & o_x & a_x & p_x \\ n_y & o_y & a_y & p_y \\ n_z & o_z & a_z & p_z \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad (2.1)$$

Main idea of computing forward kinematics is first use Denavit and Hartenberg D-H method.^[1] Specific for each connecting rod to the establishment of coordinate system and then according to the robot each joint variable value of each joint relative to the adjacent joints homogeneous transformation matrix. The final end of the robot kinematics equation is used to derive the actuators relative to the robot base frame nT_0 .

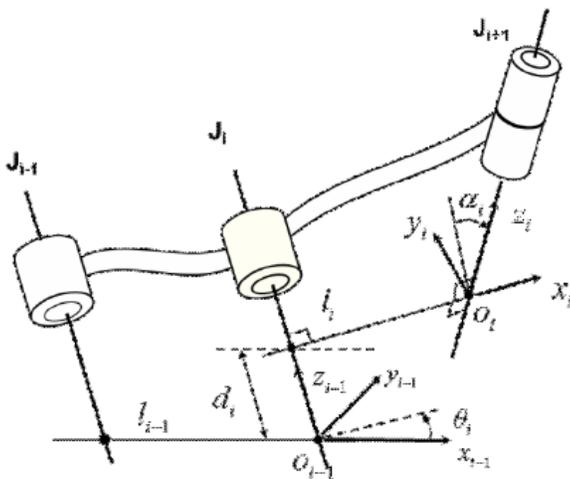


Fig.2.1 Schematic diagram of connecting rod coordinate

For the D-H method is adopted to realize each link coordinate system set up, need to use some of the parameters of each joint and the connecting rod. Which θ_i represents the Angle between the adjacent two connecting rod, d_i for the relative position between adjacent two connecting rods, and l_i normal distance, α_i is perpendicular to the normal plane. The Angle between the two adjacent connecting rod shafts, as shown in figure 2.1 for the connecting rod model. At the same time, this model includes the $i - 1$, i and $i + 1$ three joints and connected with the two connecting rods, with the axis of the three joint is normal, each joint with J_{i-1} , J_i and J_{i+1} . Set O_{i-1} For the first $i - 1$ is connected with the number i -joint connecting rod of the coordinate system origin, x_{i-1} , y_{i-1} , z_{i-1} representatives of link coordinate system of the three-axis direction. O_i number for the i connected to the $i + 1$ joint of the connecting

rod coordinate system origin, x_i, y_i, z_i for link coordinate system of the three-axis direction. i link for the establishment of coordinate system includes four processes:

- 1) To determine its position, o_i the origin of the coordinate system. j_i and j_{i+1} has a normal with j_{i+1} of intersection points.
- 2) x_i shaft, x_i axis and the j_i and j_{i+1} public normal overlap to the direction of j_i to j_{i+1} .
- 3) Determine z_i axis and j_{i+1} overlap, arbitrary direction
- 4) Determine y_i axis, after determine the x_i axis and z_i axis direction through the adoption of the right hand rule to get y_i axis direction

$${}^{i+1}T_i = \begin{pmatrix} \cos \theta_i & -\sin \theta_i \cos \alpha_i & \sin \theta_i \sin \alpha_i & l_i \cos \theta_i \\ \sin \theta_i & \cos \theta_i \cos \alpha_i & -\cos \theta_i \sin \alpha_i & l_i \sin \theta_i \\ 0 & \sin \alpha_i & \cos \alpha_i & d_i \\ 0 & 0 & 0 & 1 \end{pmatrix} \quad (2.2)$$

If robot joint type belongs to the rotational joint θ_i for the robot movement joint rotation Angle, d_i, l_i, α_i usually have been identified in robot design. So when the robot model with the connecting rod, each joint using the d-h method. Which can obtain the value of the parameter, d_i, l_i, α_i through the type (2.2) can be homogeneous solution of two adjacent joint transform matrix T, (2.1) can be calculated and then reuse the robot actuator at the end of the base coordinates transformation matrix.

B. Computing inverse kinematics

1. Numerical iteration method inverse solution

In solving the robot inverse kinematics solution^[2], the commonly used numerical iterative methods have Levenberg - Marquardt algorithm (LM) and Newton -- Raphson algorithms.^[3] These methods often need to use the Jacobi matrix to solve, because in the process of iterative Jacobi matrix has a clear the direction of search solution and determine the search direction on the function of the distance. Jacobian matrix in the kinematics of the robot is mainly used to describe differential movement and at the end of each joint coordinates.

The equation of motion of robot end actuators are as follows:

$$x = f(\theta)$$

$$\frac{dy}{dt} = \frac{\partial f}{\partial \theta} \cdot \frac{\partial \theta}{\partial t}$$

$$\dot{x} = J(\theta) \dot{\theta}$$

Type, $J(\theta)$ on behalf of the jacobian matrix. When the robot in 3 d space motion, J is 6 x n matrix (n for joint number), if n = 6, J as 6 x 6 phalanx, can be directly on the inverse.

$$J^{-1}(\theta) = \frac{Adj(J(\theta))}{|J(\theta)|} \quad (2.1)$$

Adj (J) as the adjoint matrix of $|J(\theta)|$ determinant for its value. When J is not square, in the process of the numerical iteration, use the inverse Jacobi matrix should be used when the pseudo-inverse $J^+(\theta)$ to carry out operations, and $J^+(\theta)$ is expressed as:

$$J^+ = J^T (JJ^T)^{-1}$$

J^T for transposed matrix. By the $J^+(\theta)$ correction for the theoretical basis of the joint variables:

$$d(\theta) = J^+(\theta) dx$$

Numerical iterative method is used to analyses the robot inverse kinematics, the need to constantly calculating the jacobian matrix, until achieve a certain set of requirements

2. Analytical method inverse solution

Obviously, by the robot motion equation (2.2) can get n independent equation, and the equation contains all the need to solve the unknown parameters and their solutions. Analytical method was applied to inverse kinematics of the robot, the first direct observation of n independent equation, the equation of only one variable can evaluate first, if the equation containing multiple unknown cannot solve directly, then the robot kinematics equation, using left by a series of transformation matrix inverse (T_i^{-1}) and then analyze each equation to the right elements, with the right end element equation for zero or constant as a breakthrough point, the relative should be on both ends of the equation, then solve the equations. Is widely applied in robot kinematics analytic method for inverse solution of numerical iterative method is mainly for analytic method needs a large number of calculations, requiring higher is not suitable for real time and in the design of the robot structure, usually considering its solvability of the inverse solution. [4]

C. NAO robot model and its inverse solution experiment right arm

Table 2.1 connecting rod parameters of right arm of NAO robot

Frame (joint)	θ_i	d_i / mm	l_i / mm	α_i^0
Base	A(0)	-ShoulderOffsetY	-ElbowOffset	ShoulderOffsetZ
RShoulderPitch	θ_1	0	0	-90
RShoulderRoll	$\theta_2 + \frac{\pi}{2}$	0	0	90
RElbowYaw	θ_3	0	UpperArmLength	90
RElbowRoll	θ_4	0	0	90
Rotation			$R_z(\frac{\pi}{2})$	
End effector			A(-HandoffsetX- LowerArmLength, 0,0)	
Rotation Fix			$R_z(-\pi)$	

One Shoulder Offset Y = 98 mm, Elbow Offset Y = 15 mm, Shoulder Offset Z = 100 mm, Upper Arm Length = 105 mm, using these parameters, calculate according to the type (2.5) stand out pose transformation matrix ${}^{i+1}T_i$ respectively.

$${}^1T_0 = \begin{bmatrix} \cos \theta_1 & 0 & \sin \theta_1 & 0 \\ \sin \theta_1 & 0 & -\cos \theta_1 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}, \quad {}^2T_1 = \begin{bmatrix} -\sin \theta_2 & 0 & \sin \theta_1 & 0 \\ \cos \theta_2 & 0 & -\cos \theta_2 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix},$$

$${}^3T_2 = \begin{bmatrix} \cos \theta_3 & 0 & \sin \theta_3 & 0 \\ \sin \theta_3 & 0 & -\cos \theta_3 & 0 \\ 0 & -1 & 0 & L1 \\ 0 & 0 & 0 & 1 \end{bmatrix}, \quad {}^4T_3 = \begin{bmatrix} \cos \theta_4 & 0 & \sin \theta_4 & 0 \\ \sin \theta_4 & 0 & -\cos \theta_4 & 0 \\ 0 & -1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \dots\dots\dots (2.2)$$

According to the robot kinematics equation, solve the robot actuator at the end of the base coordinate system right arm posture transformation matrix 0T_4 as follows.

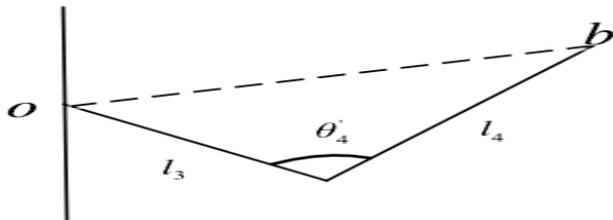
$${}^{End}T_{Base} = A_{Base}^0 {}^1T_0 {}^2T_1 {}^3T_2 {}^4T_3 R_z(\frac{\pi}{2}) A_4^{End} R_z(-\pi) = \begin{pmatrix} n_x & o_x & a_x & p_x \\ n_y & o_y & a_y & p_y \\ n_z & o_z & a_z & p_z \\ 0 & 0 & 0 & 1 \end{pmatrix} \dots\dots\dots (2.3)$$

From (2.3) , (2.2) and table (2.1) we will get

$$o_y = \cos \theta_2 \sin \theta_4 - \cos \theta_3 \cos \theta_4 \sin \hat{\theta}_2 \dots\dots\dots (2.4)$$

D. based on analytic method to solve the NAO right arm kinematics inverse solution

Such type as (2.1), (2.2) and (Shown in 2.3), directly to solve the four joint Angle rotation Angle has certain difficulty, in the process of movement, the robot is composed of upper arm, lower arm and the end executor can form a triangle



(2.2) triangle formed by robot arm

In figure 2.2 shoulder joint o is (s_x, s_y, s_z) and desired location for the end of the actuators, b is (g_x, g_y, g_z) . Euclidean distance of two points o,b is

$$d = \sqrt{(s_x - g_x)^2 + (s_y - g_y)^2 + (s_z - g_z)^2} \quad (2.5)$$

According to the law of cosines, find out θ' as follows:

$$\theta'_4 = \arccos\left(\frac{l_3^2 + l_4^2 - d^2}{2l_3l_4}\right) \quad (2.6)$$

Angle inside the triangle and RELbow Roll joint rotation from zero to positive direction stretch, so RELbow Roll joints of the actual rotational Angle is:

$$\theta_4 = \pi - \theta'_4 \quad (2.7)$$

Solving the joint Angle of θ_4 , then the value in (2.14) in solving other joint Angle, type:

$$o_y = \cos \theta_2 \sin \theta_4 - \cos \theta_3 \cos \theta_4 \sin \theta_2 \quad (2.8)$$

The range of θ_4 Angle is 0 ~ 88.5 degrees, so:

$$\cos \theta_3 \sin \theta_2 = \frac{\cos \theta_2 \sin \theta_4 - o_y}{\cos \theta_4} \quad (2.9)$$

Another :

$$p_y = g_y = -l_1 - l_3 \cos \theta_2 - l_4 (\cos \theta_2 \cos \theta_4 - \cos \theta_3 \sin \theta_2 \sin \theta_4) \tag{2.10}$$

By type (2.9) type (2.10) can be calculated:

$$\theta_2 = \arccos \left(\frac{-g_y - l_1 - \left(\frac{l_4 \sin \theta_4 a_y}{\cos \theta_4} \right)}{l_3 + l_4 \cos \theta_4 + l_4 \frac{\sin^2 \theta_4}{\cos \theta_4}} \right) - \frac{\pi}{2} \tag{2.11}$$

According to the type (2.11):

$$a_y = \sin \theta_2 \sin \theta_3 \tag{2.12}$$

The value of θ_3 as follows:

$$\theta_3 = \arcsin \left(\frac{a_y}{\sin(\theta_2 + \frac{\pi}{2})} \right) \tag{2.13}$$

When $\theta_3 \neq \frac{\pi}{2}$, According to (2.13) the value of θ_1 is:

$$\theta_1 = \arccos \left(\frac{a_y + \frac{n_x \sin \theta_3 \cos(\theta_2 + \frac{\pi}{2})}{\cos \theta_3}}{\cos \theta_3 + \frac{\cos^2(\theta_2 + \frac{\pi}{2}) \sin^2 \theta_3}{\cos \theta_3}} \right) \tag{2.14}$$

When $\theta_3 = \left| \frac{\pi}{2} \right|$, According to (2.14) the value of θ_1 is:

$$\theta_1 = \arcsin \left[\frac{a_x}{\cos(\theta_2 + \frac{\pi}{2}) \sin \theta_3} \right] \tag{2.15}$$

This paper uses the reverse thinking, using the method of robotic forward kinematics for testing. First of all, within the scope of the NAO right arm rotation of each joint, freely choose 8 groups of joint variables as the test sample, as shown in table 2.16. Then according to the kinematics of a robot is corresponding to the transformation matrix of all sample. To verify the reliability and accuracy of this method.

Table 2.2 sample data of each joint angle of right arm

sample	RShoulderPitch(⁰)	RShoulderRoll(⁰)	RElbowYaw(⁰)	RElbow(⁰)
1	20.34	-60	-64.25	0.00
2	45.89	-18.43	-0.61	13.24
3	-2.39	-1.85	-100.52	2.09
4	-56.71	10.00	102.00	41.25
5	3.48	3.94	9.34	9.24
6	100.52	-15.74	-45.78	17.23
7	-95.27	-20.99	33.26	40.54
8	3.06	5.46	-59.04	57.87

E. Kinect based robot target positioning.

Kinect get the scene RGB-D image. Converting RGB space in HSV space [5-6]. Drawing H-S color histogram and at last determining threshold segmentation range based on the histogram.

The establishment of the device coordinate system, as shown in figure below, the origin is located in the RGB camera, the x axis by origin from left to right, y-axis vertical main axis up, according to the right department law determine the z-axis. NAO robot was set up with 3 sets of the base coordinate system[7]: the world coordinate system (FRAME_WORLD), the robot coordinate system (FRAME_ROBOT) as well as the body coordinate system (FRAME_TORSO).

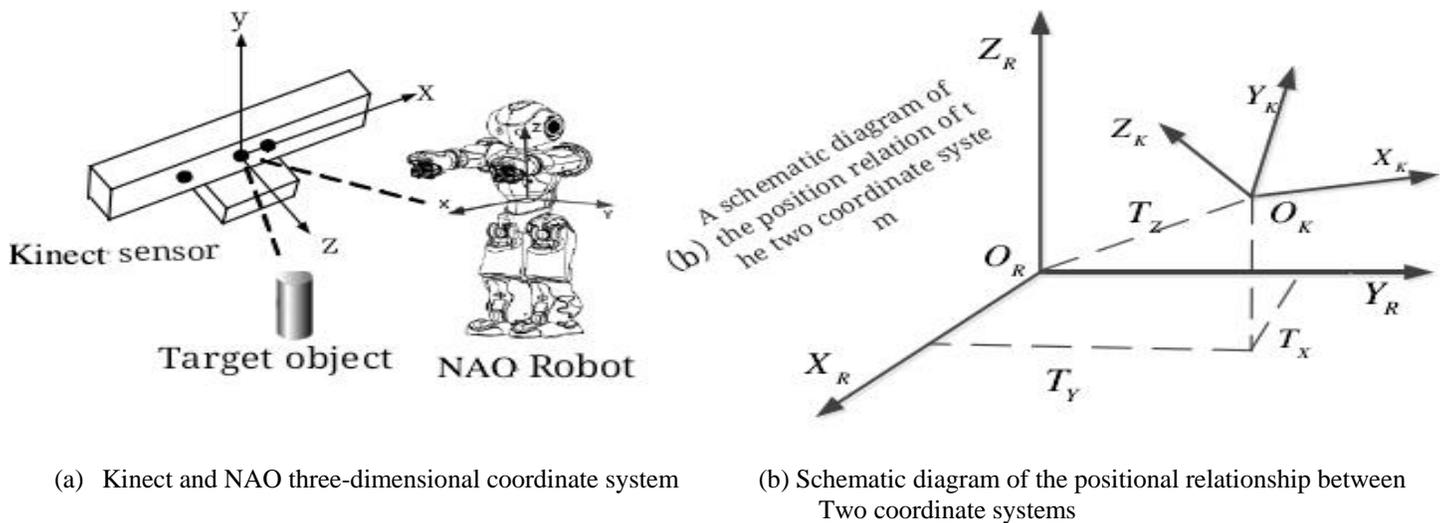


Fig 2.3 Coordinate system establishment for Kinect and NAO

The 3-d coordinate transformation model and solve the parameters. From the above fig. there are three translation quantity. There is also a large Euler angle between the axis. As long as rotational translation can make two coordinate systems. we used one of the most widely used coordinate transformation model for seven parameters of the model. [8-9]

$$\begin{bmatrix} X_R \\ Y_R \\ Z_R \end{bmatrix} = (1 + \lambda)R(\epsilon) \begin{bmatrix} X_K \\ Y_K \\ Z_K \end{bmatrix} + \begin{bmatrix} \Delta T_x \\ \Delta T_y \\ \Delta T_z \end{bmatrix}$$

Type, $[X_K Y_K Z_K]^T$ point coordinates in the device coordinate system $[X_R Y_R Z_R]^T$ for the coordinates of points in the robot coordinate system; The scaling factor lambda for dimension; As $[\Delta Tx \ \Delta Ty \ \Delta Tz]^T$ said coordinate translation; $R(\epsilon)$ as the rotation matrix and $R(\epsilon) = [R(\epsilon_x) R(\epsilon_y) R(\epsilon_z)]$. Two corresponding Euler Angle coordinate system; As definition $dx = (\Delta Tx \ \Delta Ty \ \Delta Tz \ \epsilon_z \epsilon_y \epsilon_x (1 + \Delta))$

For vector coordinate transformation parameters. In solving coordinate conversion model to solve the dx seven unknown parameters, and it usually takes three or more than three common points with two sets of coordinates. As a result of the existence of common point inevitable error, the introduction of coordinate correction, will get type type (3.8) (3.9) as shown in the error equation

$$e_{3n \times 1} = A_{3n \times 7} \cdot dx_{7 \times 1} + l_{3n \times 1}$$

Type: n common point number; A for the coordinate transformation matrix. l for observation vectors for the two-coordinate system.

$$l_{3n \times 1} = [x_k - x_R \quad y_k - y_R \quad z_k - z_R]^T$$

When $n > 3$, the coefficient matrix A often exist error, will introduce the total least squares algorithm model, as shown below:

$$e - l = (A - E_A) \times dx \tag{2.16}$$

$$(rank(A) = m \square n)$$

The error vector e, E_A for error matrix of coefficient matrix A, for solving the parameter vector dx, the key is the E_A reduction effect matrix A, but the direct solution has the certain difficulty. Therefore, this article adopts linear total least squares algorithm (LTLS) type for linear processing, can simplify the calculation process and to ensure conversion precision^[10]. At this point, provide the n observer $L_1, L_2, L_3 \dots L_n$ in order to estimate t an independent variable.

$$\begin{aligned} L_1 &= L_1 + V_1 \\ L_2 &= L_2 + V_2 \\ &\dots\dots\dots \\ L_n &= L_n + V_n \end{aligned} \tag{2.17}$$

Type of V_i for the remaining vector observer, if n observers are linear model:

$$\begin{aligned} &F_1(x_0 + \zeta)L_1 + F_1(x_0 + \zeta)V_1 + F_2(x_0 + \zeta)L_2 + F_2(x_0 + \zeta)V_2 \\ &+ \dots\dots + F_n(x_0 + \zeta)L_n + F_n(x_0 + \zeta)V_n + F_0(x_0 + \zeta) = 0 \end{aligned} \tag{2.18}$$

X_0 for variable is obtained by nonlinear total least square algorithm approximation, the approximate correction factor said had estimated when $F_i(x_0 + \zeta)$ is a nonlinear equation, using Taylor's series of X_0 first derivative:

$$\begin{aligned} &F_1(x_0)L_1 + F_1'(x_0)L_1 \zeta + F_1(x_0 + \zeta) V_1 + \\ &F_2(x_0)L_2 + F_2'(x_0)L_2 \zeta + F_2(x_0 + \zeta) V_2 \\ &\quad \vdots \\ &F_n(x_0)L_n + F_n'(x_0)L_n \zeta + F_n(x_0 + \zeta) V_n + \\ &F_0(x_0) + F_0'(x_0)\zeta \end{aligned} = 0 \tag{2.19}$$

$$\begin{matrix} \downarrow & \downarrow & \downarrow \\ L & A\zeta & BV \end{matrix}$$

Type (3.14) is another form of equation (3.8), and contains all observer residuals. When all the observer is independent, objective function can be written as:

$$\phi = V_1^T P_1 V_1 + V_2^T P_2 V_2 + \dots + V_n^T P_n V_n - 2K^T (A\zeta + BV + L) = \min \tag{2.20}$$

P for the observed value of weight matrix, the Lagrangian function of $m \times 1$ K said vector, finally through the euler - Lagrange necessary condition to get the necessary equations as follows:

$$\frac{\partial \phi}{\partial V_1} = 0, \frac{\partial \phi}{\partial V_2} = 0, \dots, \frac{\partial \phi}{\partial V_n} = 0; \frac{\partial \phi}{\partial \phi} = 0 \quad (2.21)$$

The equation (2.19), (2.20) and equation (2.21) integration:

$$dx = \left[A^T P_i \left(\sum_{i=1}^n F_i^2(x_0 + \zeta) \right)^{-1} A \right]^{-1} \bullet \left[A^T P_i \left(\sum_{i=1}^n F_i^2(x_0 + \zeta) \right)^{-1} L \right]^{-1} \quad (2.22)$$

According to the type (2.21) can solve the dx parameter vector can be obtained according to the type (2.22) out of all the value of the parameter vector dx, so the coordinate transformation model is able to solve. All the values, so the coordinate transformation model is able to solve.

(3) The robot localization grab points

By LTLs algorithm to solve the coordinate transformation model to establish a linear relationship between two sets of coordinate system, the device coordinate system according to the right-hand rule x axis rotate - PI / 2, and then around the z axis rotation Angle of PI / 2. The rotation after two, two corresponding coordinate axis Angle with small Angle linear relations, transition matrix T as follows:

$$T = R_x \left(-\frac{\pi}{2} \right) R_z \left(\frac{\pi}{2} \right) \quad (2.23)$$

$$\begin{bmatrix} X'_K & Y'_K & Z'_K \end{bmatrix} = T \begin{bmatrix} X_K & Y_K & Z_K \end{bmatrix} \\ = \begin{bmatrix} -Z_K & -X_K & Y_K \end{bmatrix} \quad (2.24)$$

Image processing through access to information and access to common point in device coordinates of the initial coordinate values for

$\begin{bmatrix} X_K Y_K Z_K \end{bmatrix}^T$ again by type (2.22) type (2.23) for coordinate transformation to calculate the actual public point coordinates

$\begin{bmatrix} X'_K Y'_K Z'_K \end{bmatrix}^T$. The coordinates of the common point in the robot coordinate system $\begin{bmatrix} X_R Y_R Z_R \end{bmatrix}^T$ by robot position sensor and precise measurement. When the device and robot coordinate corresponding direction axis Euler Angle for small Angle:

$$\sin \epsilon \approx \epsilon, \cos \epsilon \approx 1$$

$$R(\epsilon) = \begin{bmatrix} 1 & -\epsilon_z & \epsilon_y \\ \epsilon_z & 1 & -\epsilon_x \\ -\epsilon_z & \epsilon_x & 1 \end{bmatrix} \quad (2.25)$$

$$P_i \left(\sum_{i=1}^n F_i^2(x_0 + \zeta) \right)^{-1} = E$$

By type (3.8) type (3.9) can be coefficient matrix A is:

$$A_{3n \times 7} = \begin{bmatrix} 1 & 0 & 0 & 0 & -z_{k1} & y_{k1} & x_{k1} \\ 0 & 1 & 0 & z_{k1} & 0 & -x_{k1} & y_{k1} \\ 0 & 0 & 1 & -y_{k1} & x_{k1} & 0 & z_{k1} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ 1 & 0 & 0 & 0 & -z_{kn} & y_{kn} & x_{kn} \\ 0 & 1 & 0 & z_{kn} & 0 & -x_{kn} & y_{kn} \\ 0 & 0 & 1 & -y_{kn} & x_{kn} & 0 & z_{kn} \end{bmatrix} \quad (2.26)$$

The first scene of the sensor device to collect information for a series of image processing and recognition for coordinate transformation common point coordinate positioning and target grasping point coordinates; Then will be two rotating device

coordinate system transformation to get the new device Coordinate system, and then obtain common point and target fetching in the new system of coordinates and common point coordinates in the robot system; Finally, using the LTLS algorithm of coordinate conversion parameters and according to the coordinate transformation model will be called target grasping point coordinate transformation under the new coordinate system to the machine Coordinate system, when the coordinate transformation value and the error between the actual value is less than 1 cm then completed the robot grasping point positioning otherwise repeat the above process.

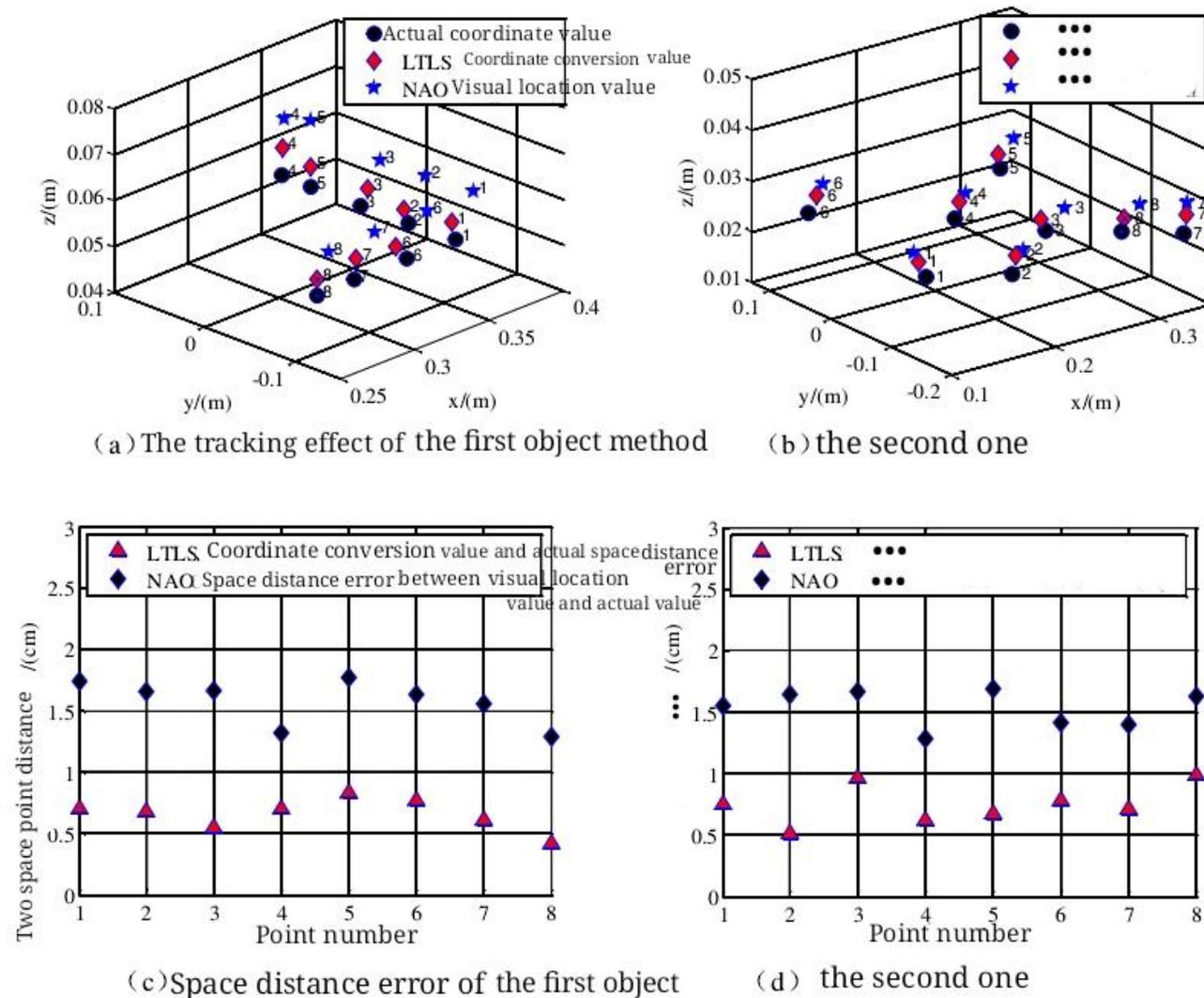


Fig.2.4 experiment result

Aiming at the shortcomings of the traditional visual sensor exists, use it depth sensor camera instead of a humanoid robot ontology, this paper proposes a humanoid robot target positioning system based on access, information provided by the device scene make a series of image processing, segment the target object, and realized to the center of the target object positioning. By building access and robot coordinate system and the transformation model using linear total least squares (LTLS) algorithm to solve the model then Device coordinates of target capture under accurate point coordinate to robot coordinate, so as to realize the robot positioning objects. In humanoid robot NAO platforms, experiments have been carried out to verify this method and analyzed the deficiency of this method. The results show that within a certain space, when using this method for target localization, can meet the required the

positioning accuracy of robot grasping objects, positioning accuracy is higher. The NAO monocular vision again to grab objects for subsequent robot operation.

III. Motion path planning algorithm based on improved RRT*

Motion path planning refers to planning a plan according to a specified standard under certain constraints. The path from the initial state to the target state collision avoidance. According to which the robot can avoid obstacles and perform task operations. According to the planning space can be divided into motion path planning under space and Cartesian space. Among them, although the motion planning in the joint space has better real-time performance, it lacks an intuitive path planning process; In Cartesian space, it is necessary to convert the pose information into a joint angle which is computationally intensive but in an obstacle environment. This space is easier to plan for joint space when panning a path. The robot may be subject to physical constraints and obstacles when performing the grab operation etc. Where the physical constraints are mainly refers to the limitations of the model of the robot itself such as, the length of the link and the range of joint motion. Obstacle constraint refers to the operation. There are objects in the workspace that prevent the robot from performing the grab. Therefore, when studying the target of humanoid robots. By defining the workspace and storing the reachable area information of the robot can avoid doing nothing outside the constraints. Traditional motion path panning algorithms include artificial potential field method, grid method, viewable method and topological method. As the robot joints continue to increase the amount of calculations is also the exponential relationship. Therefore, the traditional method is difficult to meet the multi-joint robot for collision avoidance path planning in complex environments. However, the sampling-based motion path planning algorithm refers to the collision avoidance of sampling points in the workspace. Crashing to find a feasible path, avoiding the specific construction of the task space, reducing the amount of calculation and path planning can also be effectively performed in high-dimensional space and complex environments. Therefore, this paper selects the sampling-based planning algorithm for the machine. The scene capture process performs motion path planning. In the cartesian space, the NAO robot is sitting on the torso. Marked as the base coordinate system, the iterative method and geometric method are used to solve the reachable space range of the right arm of the NAO robot. And through MATLAB for simulation experiments; then summarize several sampling planning methods. The deficiencies of the algorithm are proposed and the improved RRT* algorithm is used to plan the motion path of the humanoid robot arm.

The Rapidly Random Tree method (RRT) [11-12-13] means that in the workspace, the initial nodes are continuously connected by random sampling. The sampling point in free space until the position near the target point or the target point is queried, and the free sampling is performed by connecting the initial point. The algorithm can not only solve the problem of multi-degree-of-freedom robot path planning problem and also guarantee the speed of planning and the quality of the path, the computational complexity will not increase with the complexity of the environment nor use a road map in advance. Therefore, this paper selects this algorithm for robot grasping motion path planning.

Lozano Perez and Wesley state Space was put forward for the first time in 1978 (the Configuration Space), referred to as C_{space} [14]

Convenient for the structure of the planning implement and then gradually put forward the C_{free} free Space and

$C_{obstacle}$ Obstacle Space concept. In the space the robot is represented as a point. path planning for robot arm movement then converted into a point for the path planning. In the plane C_{space} , the basic RRT algorithm extended process as shown in the fig below.

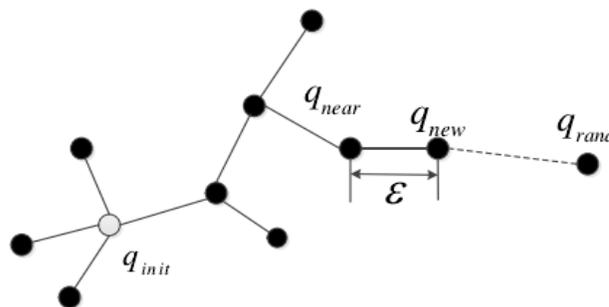


Fig. 3.1 The RRT algorithm search processes

Defines C_{free} without collision free space, C_{obs} to contain obstacle space, q_{init} as the starting point of the initial state, q_{goal} to end point target state, namely q_{init} and q_{goal} are C_{free} . In a bit. T_n for RRT containing n nodes, and $T_n \in C_{free}$. Random sampling point

in C_{space} for q_{rand} , is only effective in C_{free} q_{rand} , after by setting RRT search step length, find the distance q_{rand} recent q_{near} leaf node, and $q_{near} \in T_n$. According to the Euclidean distance, define $D(x_1, x_2)$ said the x_1 state to x_2 distance, one of them $X_1, x_2 \in C_{free}$, usually $D(x_1, x_2)$ less than or equal to the RRT step length. From q_{near} on q_{near} and q_{rand} direction vector to $D(x_1, x_2) = \epsilon$ for conditions. To explore a new node q_{new} if q_{new} exists and $q_{new} \in C_{free}$ is to expand the node is added to the tree of T_n and T_n to T_{n+1} . If $q_{new} \in C_{obs}$, select q_{rand} again, repeat the extension steps, Until the search out the finish item standard or radius is P , target for the circle in the center of the node which is suitable for a small fixed P value. q_{new} calculation formula is:

$$q_{new} = q_{near} + \rho * (q_{rand} - q_{near}) / \|q_{rand} - q_{near}\|$$

Use of RRT algorithm in $[0, 500] \times [0, 500]$ barrier-free plane space, iteration 50,200,500,1000,1500,2000 from step as shown in figure 4.2.

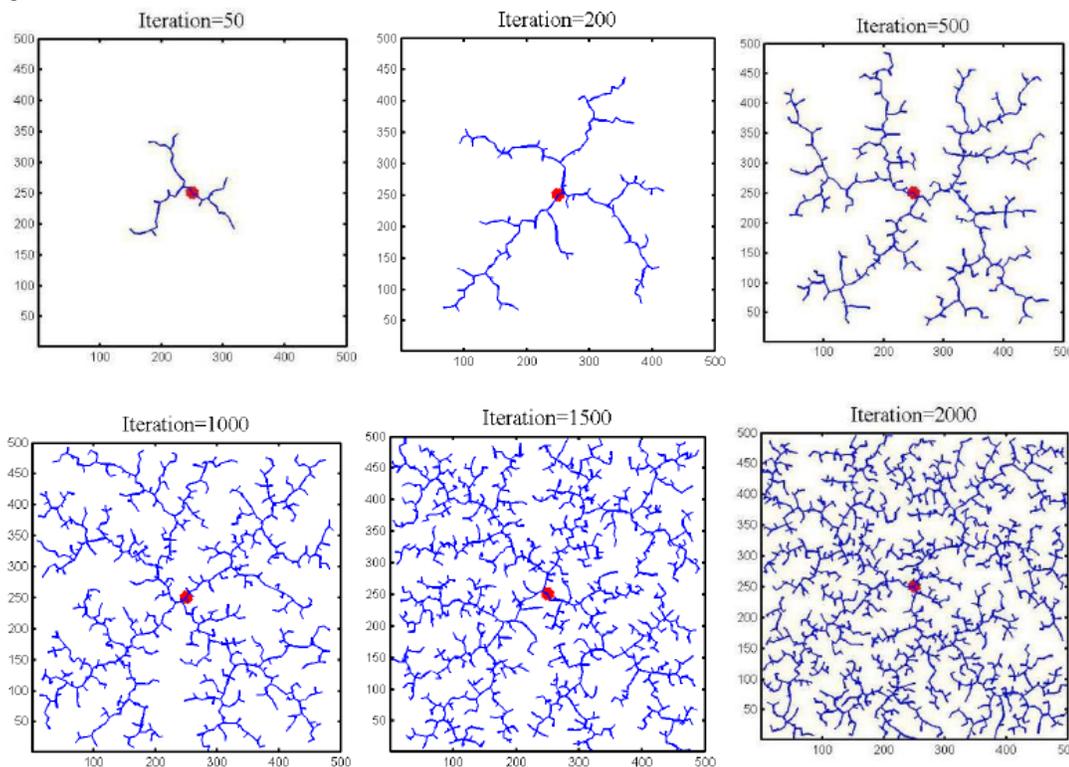


Fig. 3.2 Experiment of the RRT algorithm

Can be seen from the figure 3.2, with the increase of the number of iterations, constantly extend in the state space not search tree node and the subject branches extend four vertices. When after reaching a certain number of random sampling point, expand the tree will be throughout the whole state space, which reflects the RRT algorithm has the characteristics of probability and integrity and show the extension node consistency with the distribution of the random sampling points. At the same time, due to the expansion of RRT algorithm by detecting movement process node whether collision, without the need for obstacles to specific modeling in state space, improve the efficiency of the motion planning. RRT algorithm also has to solve high-dimensional space characteristics of the motion planning problem. Although the algorithm has many advantages and researchers widely used, but it also has some disadvantages. Due to the extended tree is based on random sampling points generated in state space So easy to cause when performing the same task every path of planning are not identical, to reduce the repeatability of operation; Obtained by random sampling points at the same time the randomness of extension path, and sometimes get path is close to the optimal path planning, sometimes deviate from the optimal path, and the convergence speed is slow.

At present, aimed at the shortcoming of RRT algorithm mainly from two aspects of sampling strategy and expanded form is improved^[15-16]. An improved algorithm based on sampling strategies mainly include: set the target for the sample point planning Goal - Bias algorithm, this algorithm also can design the number of occurrences of target in the search process. Goal - through around the target increase sampling frequency Zoom algorithm to improve the speed of convergence to the target point etc. Extension form

improvements include improving the convergence rate of bias RRT_Connect extended tree, two-way Random extension algorithm (or called Bidirectional Rapidly - Exploring the Random Trees, Bi - RRT) and optimize the path of the quality of RRT * algorithm.

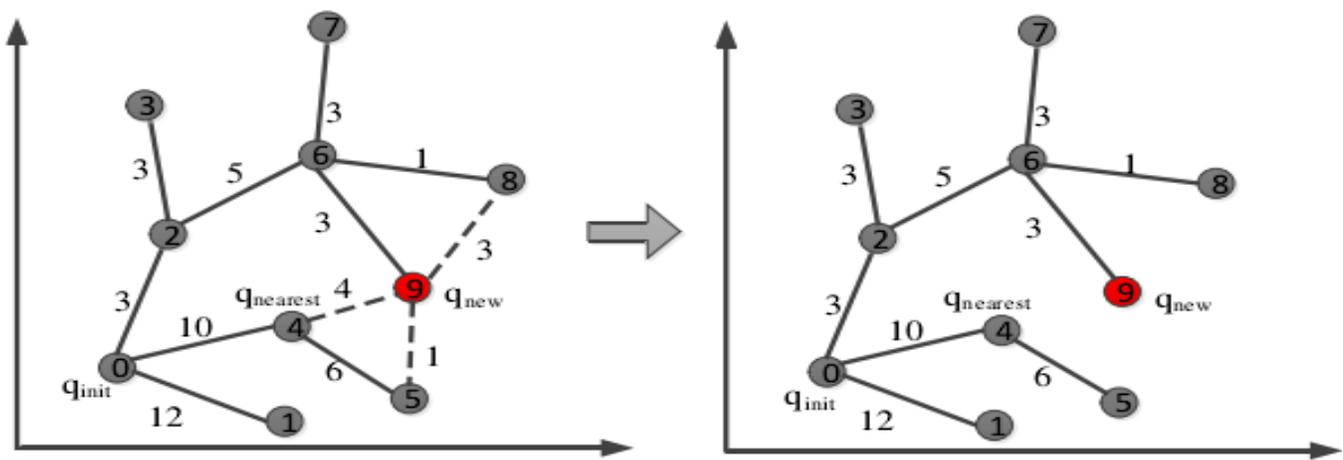
(1) Two-way random extended tree algorithm (Bi-RRT or RRT_Connect)

Due to the many obstacles or high degrees of freedom robot cases, the basic RRT algorithm will spend a lot of time for sampling and detection of collision avoidance, reduce the planning efficiency. Therefore, Kuffner presents a two-way random extension RRT algorithm, namely RRT_Connect algorithm. This algorithm and the basic RRT algorithm mainly has two difference: 1) the initial state points q_{init} and target terminate q_{goal} two trees extension structure at the same time, in the process of iteration, the application of Swap (T1, T2) functions, the two trees extend towards each other, until the two meet, so the algorithm is a heuristic search and not as random as basic RRT algorithm search. 2) The Connect () function (T, q) the introduction of each loop in q_{near} exploring and q_{rand} direction vector multistep to detect obstacles is different from the basic RRT algorithm. only explore step improve the speed of tree extension.

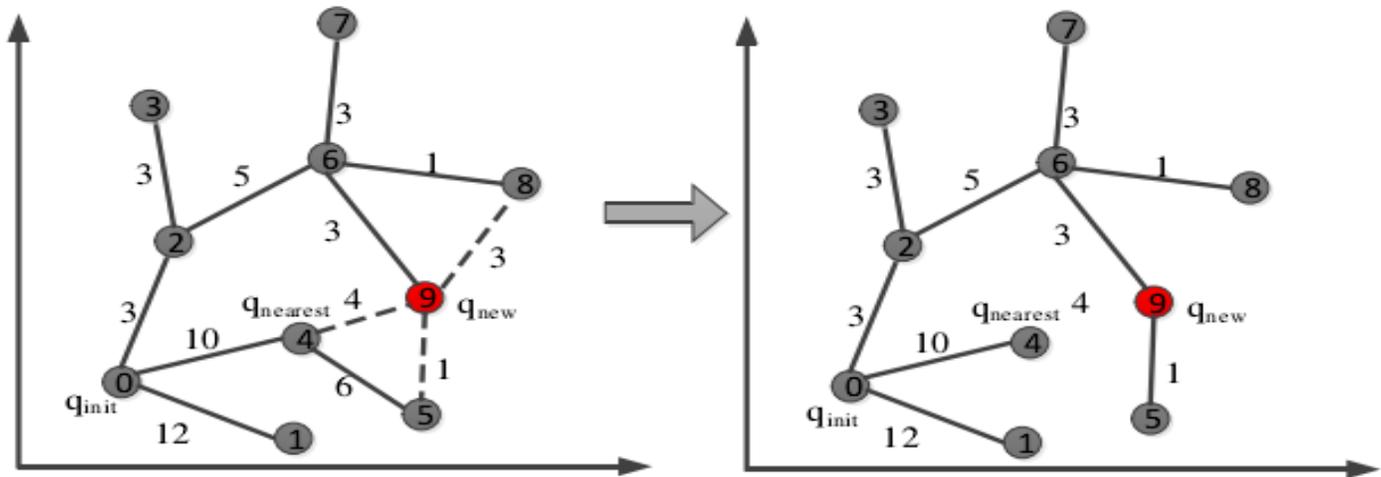
(2) The RRT * algorithm

The RRT path planning algorithm randomness makes planning often deviate from the optimal path as a result in improving the quality of path planning. which made certain contribution to many researchers. Sertac and Emilio RRT * algorithm^[17] (Rapidly - exploring the Random Tree Star) to ensure that the planning path gradually tend to be optimal and analyzed from the Angle of the theory of how to be optimal and verified RRT.

RRT * algorithm in pseudo code, Cost (q) has been search tree calculated from the initial point to the extension point q path cost. Each extension is a new node, during this period need to figure out what is cost price. RRT * algorithm and obvious difference is the basic RRT algorithm. There is no direct q_{new} with the newly generated node q_{near} connected but do the processing of two aspects: 1) the corresponding algorithm 3, ChooseParent () function modules: the new node near q_{new} q_{near} , explore to Cost (q_{new}) price Cost minimum and use it as a q_{new} Parent node, to ensure that the new extension node q_{new} with local costs at a minimum Cost figure 4.6 (a) shows the improvement of schematic diagram; 2) in the corresponding Algorithm3 ReWire () function modules: when the q_{near} nodes near after a new node q_{new} the path cost cost less than the price of before q_{near} . Will replace for q_{near} to q_{new} node, as shown in figure 4.3 (b) schematic diagram for it.



(a) RRT * algorithm first optimization



(b) RRT*algorithm second optimization

Fig. 3.3 The two optimization steps of the RRT* algorithm

(3) Improved RRT * algorithm

RRT*algorithm is presented the basic RRT algorithm to improve the quality of the path planning but still a planning efficiency is low. The defects of slow convergence to the optimal path. Two-way random extended tree algorithm is the basic RRT algorithm improves the efficiency of path planning. This paper introduces the search strategy to RRT *, the grid application is fast search algorithm at the same time improved further make the planning efficiency.

In this article the main ideas of grid fast search algorithm include two points:

(a) the division of grid, due to the multiple grid division will bring the double increase of time and space complexity, so only here on a grid. In plane state space, first of all, according to the scope of the work area to determine partition set MinX, MaxX ,MinY, MaxY to x and y direction on the range of minimum and maximum range (in the three dimensional state space in the same way to increase the z axis), set up two axes divided step for k, $k > r$, r q_{new} find nearby node set distance, Among them:

$$m = \frac{MaxX - MinX}{K}$$

$$n = \frac{MaxY - MinY}{K}$$

(b) To calculate the position of all sampling points and extension points in the grid and recorded. In the new node q_{new} and node q_{near} nearby, just under the grid search rather than traverse the r Within the scope of all the nodes. The grid search algorithm diagram as shown in 4.4.

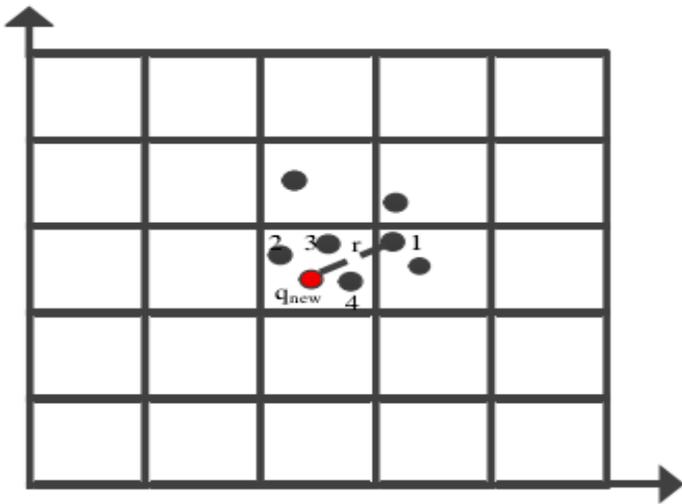


Fig. 3.4 The schematic diagram of grid search method

Extension of the new node q_{new} directly to the vertex 2, 3 and 4 as node Q_{near} recently, and no longer will the vertices 1 as the nodes near the next price cost calculation comparison, thus reducing the cost in the process of trajectory planning time, improve the search efficiency.

IV. Experimental comparison and analysis

This section mainly under the plane space and three-dimensional space for robot path planning algorithm for validation because only care about the positions of the robot in the plane, so the robot as a point. An obstruction in the simulation environment, by comparing the basic RRT algorithm, the original RRT * algorithm and improved RRT * algorithm and the programming efficiency so as to verify the improved RRT * reliability and validity of the algorithm.

Plane state space selection range of 40 x 40 inside the space Settings as shown in figure 4.9 Shown in the two irregular quadrilateral as obstacles, on the right side of the barrier of vertex set to $\{(5.27, 5.27), (0.18, 0.18), (2.98, 2.98), (7.96, 7.96)\}$, the left obstacles vertex set to $\{(4.25, 0.025), (12.89, 5.18), (4.01, 8.48), (0.58, 1.44)\}$. q_{init} initial node and destination node q_{goal} (15, 5.5) and (8, 3.65)

respectively. Max-step = 0.5, find nearby nodes radius $r = 1.5$, $\delta_{p_{goal}} = 1$. Figure 5.1 shows the basic RRT algorithm, the original RRT * algorithm and improved RRT*. Without collision algorithm under different number of iterations planning path graph. Among them, the black irregular are obstacles, green for extended tree leaf nodes on behalf of the search process and Blue is from the initial point to the target point path planning.

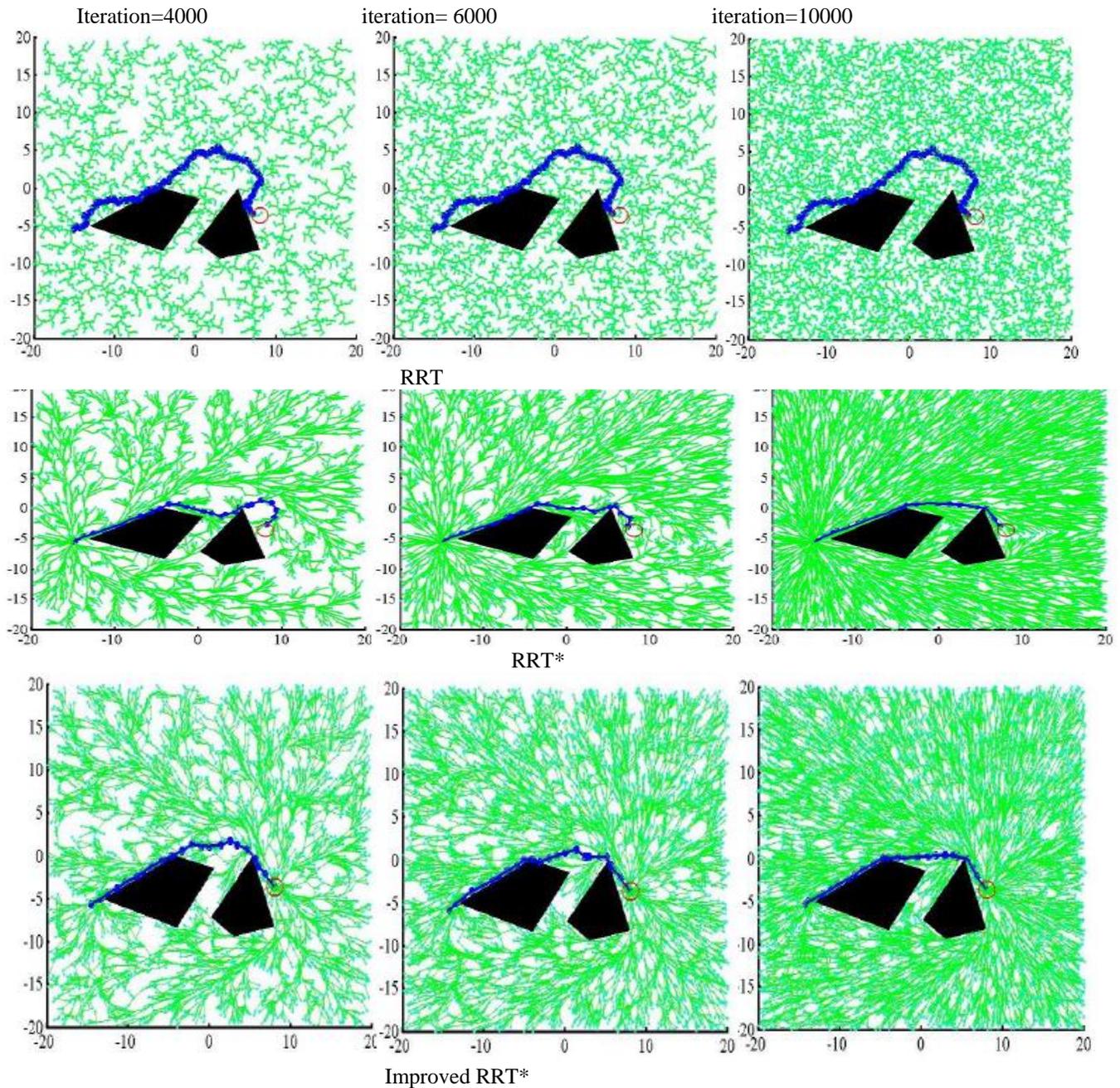


Fig.4.1 Path planning of different algorithms in 2D plane

As you can see from figure 5.1 winding basic RRT algorithm, deviating from the shortest path, and with the increase of the number of iterations path has not been optimized. With the increase of iteration times in RRT * algorithm the basic RRT path planning gradually tend to be optimal, and the improved RRT *. Planning algorithm is more primitive RRT * algorithm path a little advantage. In figure 4.1 environment, the number of iterations is seven thousand times (stable state the number of iterations), 50 on three different algorithms respectively. Time simulation, calculate the iterative search path in the process of planning, cost, and tend to be optimal. Path used by the average of the time, as shown in table 4.1. Along with the increase of the number of iterations, the three different algorithms converge to the optimal path of trend as shown in figure 4.2.

Tab 4.1 The average sampling points and planning points of the three algorithms in plane space

Algorithm	The average path planning point (a)	The average price cost	The average time (s)
The basic RRT	79	42	38.768
RRT * algorithm	26	26.953	32.343
The improved RRT * algorithm	22	24.475	11.446

From table 4.1, the original RRT * algorithm than the average number of path planning point of basic RRT algorithm significantly reduced, path quality has improved, but the path to the optimal value of the time difference; And the improved RRT * algorithm on path planning efficiency obtained significantly higher, on average spending more primitive path planning point and average price RRT * algorithm is also reduced slightly.

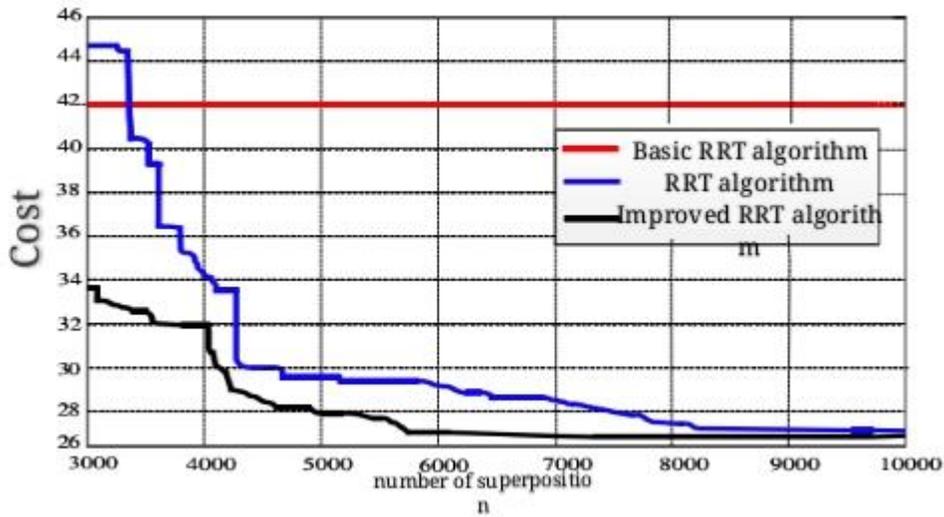


Fig.4.2 Three different algorithms converge to the optimal path in Plane space

As can be seen from the figure 4.2, with the increase of the number of iterations, basic RRT algorithm program did not get any improvement in the quality of the path and use RRT * * planning algorithm and the improved RRT path are gradually tends to the optimal path; At the same time, due to the improved RRT * algorithm introduces the bidirectional search strategy and the grid search algorithm quickly, make it has dramatically improved the efficiency of path planning.

In $[0100] * [0100] [0100]$ of the simulated in three dimensions as shown in figure 4.11 the four obstacles, obstacles radius to 10. Selection of initial point $q_{goal}, 10,10 (10)$, target $q_{goal}, 90,90 (90)$, from the initial point to the target point, set extension step $max_step = 5$, find nearby nodes radius $r = 1.5$, the target radius around $delta_pgoal = 1$, the basic RRT, original RRT * and improvement of motion path planning with RRT * algorithm respectively, as shown in figure 4.11

As shown in the three algorithms were used respectively to iterative 6000 times, 8000 times and 6000 times the path of the map.

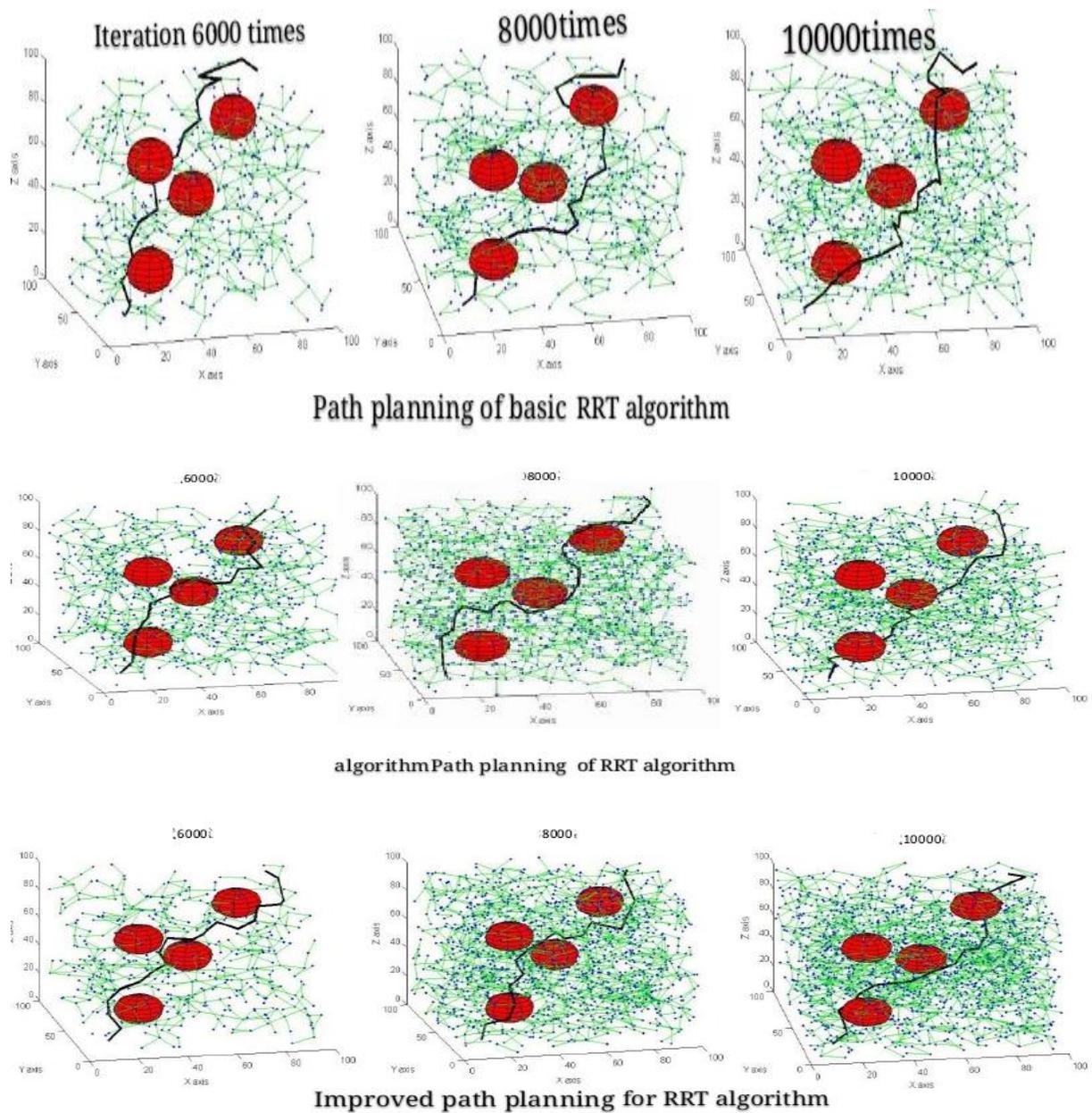


Fig. 4.3 The path planning of different algorithms in 3D space

Figure 4.3, the red is the obstacles; Blue dots for extended tree leaf nodes, on behalf of the extension process in the sampling point; Green to extension of branches dry, black represents the initial point to the target point path planning. Can be seen from the diagram, in 3 d space, planning and randomness of the path of the basic RRT algorithm^[18-20], and with the increase of the number of iterations, motion path has not been any improvement; Under the same number of iterations, the improved algorithm of RRT * than the original RRT * algorithm slightly close to the optimal path, and still has gradually improved RRT * algorithm characteristics of the optimal path. Similarly, in figure 4.11 environment, select the number of iterations is 10000 times (stable state the number of iterations), the three different algorithms for 50 times independent experiment, calculate the path planning in the process of iterative search point, cost and cost Tends to the optimal path used the average of the time, as shown in table 4.2

Table 4.2 The result of three different algorithms in 3D space

algorithm	Average path planning point (one)	cost	Mean time (s)
Basic RRT	113	67	45.174
RRT algorithm	64	39.643	41.238
Improved RRT algorithm	57	24.375	14.966

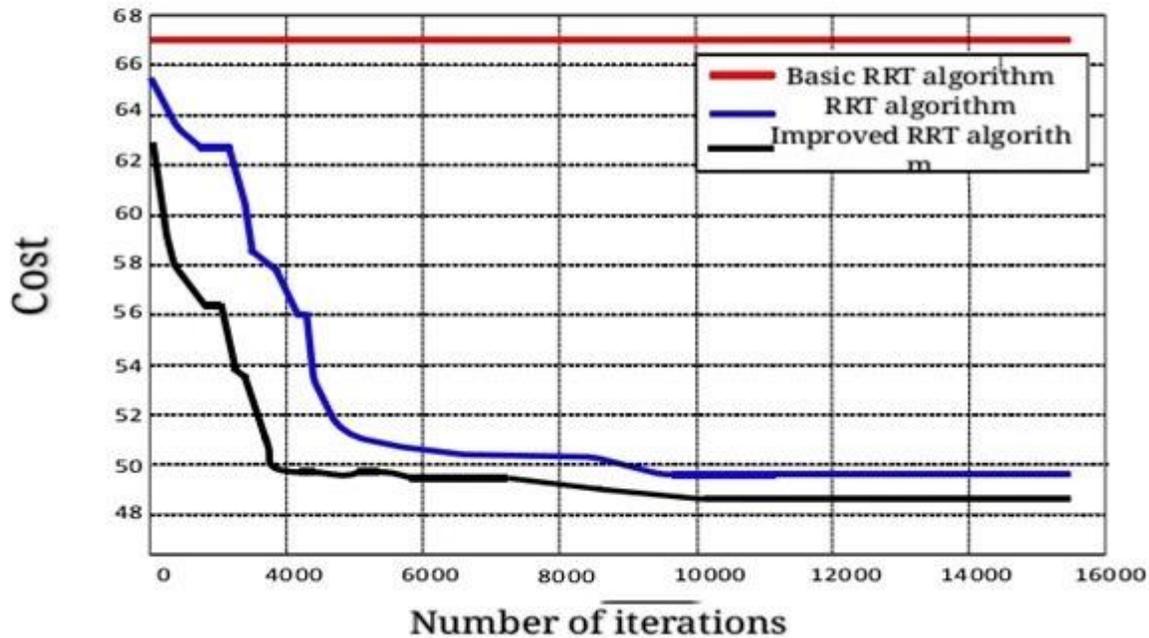


Fig. 4.4 Three different algorithms converging to the optimal path in 3D

From table 5.2, you can see that in the three-dimensional space, the improved RRT * algorithm than the basic RRT Path planning algorithm and the original RRT * average number of points is less, the average price to cost less than other two algorithms, and significantly improve the efficiency of path planning. Figure 4.12 shows along with the increase of the number of iterations, the basic RRT, original RRT * and the improved RRT * algorithm converges to the optimal path in the three-dimensional space of the trend, the same as the plane space, planning the path of the price remains the same, basic RRT algorithm RRT * algorithm and the improved RRT path gradually tend to be the most * algorithm programming Optimal, and using the improved RRT * algorithm for path planning efficiency compared with other two kinds of algorithm is improved. Comprehensive the above two kinds of environment simulation experiment, the results show that the improved RRT * algorithm not only retained the characteristics of the RRT * algorithm optimized gradually, and significantly improve the efficiency of the motion path planning.

*1. Based on the improved RRT * algorithm applied in the robot arm movement planning*

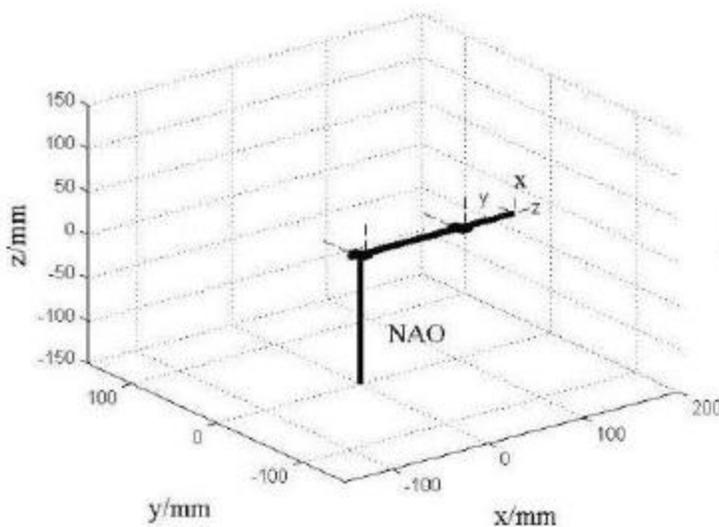
To verify the improved RRT * algorithm can exercise in high-dimensional space robot path planning, this section will be the algorithm used in humanoid robot NAO arm motion path planning, basic, at the same time RRT algorithm and original RRT * algorithm was analyzed. Because the NAO robot is a multi-degree of freedom rigid robot so according to the previous right arm NAO robot kinematics model is established. On the model by using MATLAB Robotics, offline simulation Toolbox. Selection of robot pose space for its state space because the NAO robot posture affects only the fifth joint arm transformation in the process of path planning not to consider the first joints and position of the object. To be close to the motion planning again when ready to grab the arm the process of planning the step length selection to 10 mm near nodes radius r is set to 10 mm target radius around $\Delta p_{goal} = 0.5$ mm

and established point set up several obstacles. Using basic RRT algorithm, RRT * algorithm and the improved RRT * algorithm 50 times independent experiments respectively and calculate the average number of path planning point on average spending and converge to the optimal path, cost and average time used, as shown in table 5.3

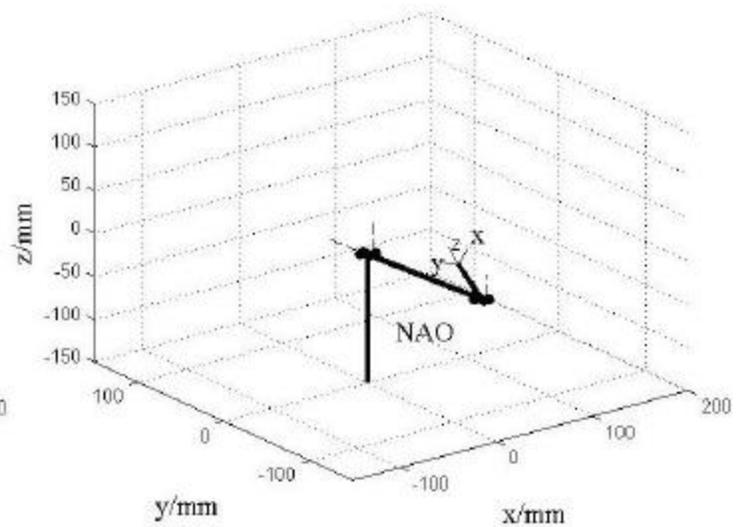
Table 4.3 The result of three different algorithms for robot arm path planning.

algorithm	Average path planning point	Average cost	Mean time(s)
RRT	68	41	29.565
RRT*	39	28.643	28.374
Improved RRT*	33	26.375	17.135

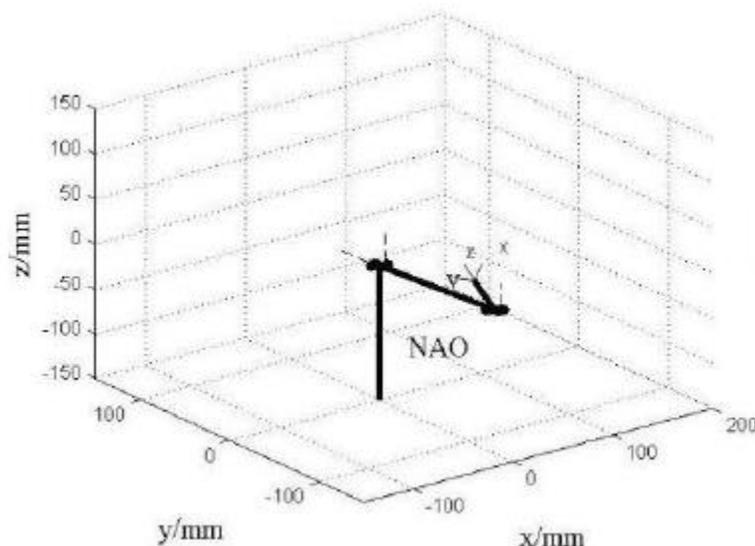
Simulation humanoid robot NAO arm using the improved RRT * algorithm. Motion path planning of the main process as shown in figure 4.5, among them, select the initial configuration of NAO robot for $[0.5^\circ, -0.5^\circ, 90^\circ, 2^\circ]$, according to the configuration, through the robot kinematics solution of the initial state of the location of the end executor for (160 mm, 0 mm, 0), as shown in figure 4.5(a) Shown below. Figure 4.5 (b) for the robot arm close to the target object by slow mobile robot arm to target point location (45 mm, 55 mm, - - 12 mm), as shown in figure 4.5 (c), as shown in the mobile robot arm to another location as shown in figure 4.5 (d).



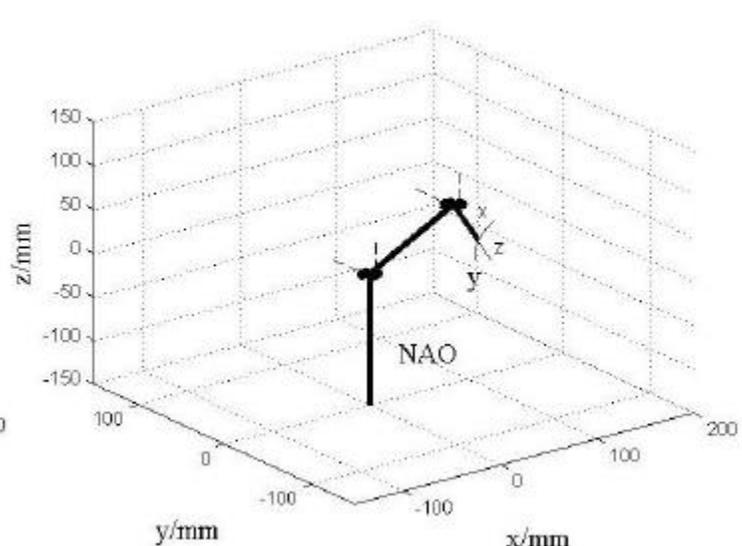
(a) the initial configuration



(b) close to the target location



(c) to arrive at the target location



(d) remove the arm

Fig. 4.5 Simulation Experiment of Robot Arm Motion Path Planning

II. No obstacle constraints object grab operation

The purpose of this experiment was to study no obstacle constraints, through the above design based on the device Object orientation, implementation of the humanoid robot with target positioning of the object, and use the change RRT * algorithm of NAO robot arm motion path planning out a feasible and finally according to the path planning by controlling a robotic arm with the target object grab operation.

NAO robot end execution for three fingers of dexterous hand, the thumb is about 2.87 cm long, the other two fingers is about 4.31 cm long, and controlled by a motor, hands up to grab 300 g items, therefore, this article selects target grab objects are moderate weight and volume of the object. first of all, through the access real-time identification of the target object and the common point is used to coordinate transformation, using coordinate transformation method, the target object coordinate transformation to the NAO robot system, thus grasping the coordinates of the point p2 (0.2276, 0.0507, 0.0507). Among them, the main process of image processing

- (a) the original RGB images,
- (b) the image expressed by HSV color space,
- (c) shows by color threshold in HSV color space the image after segmentation,
- (d) using median filter and morphological image processing

Set the NAO robot stands for the initial state, the initial point coordinate information obtained by robot position sensors, as p0, at this point $p_0 = (0.0627, 0.115, 0.0627)$, p1 to target a certain position at the upper right, his fingers when p1, and adjust the finger gestures, the set purpose is to facilitate fetching, p3, p4 to move the position of the target. One point between p1 and p2, p3 and p4 between points for the fourth chapter puts forward the improved RRT * algorithm to generate the middle path of some. Through the study of the mechanical arm of all path points inverse kinematics solution and assigned to the robot, drive robot arm by p0 movement to p1, the point through the middle path to p2, after arriving in p2 closed crawl robot fingers, then move up the object distance (convenient move objects)

P3, finally after planning out of the intermediate point movement into p4, at this point, to complete the task of the whole system operation. Figure 4.6 shows the grab motion path of success, the motion planning step length is 0.04 m.

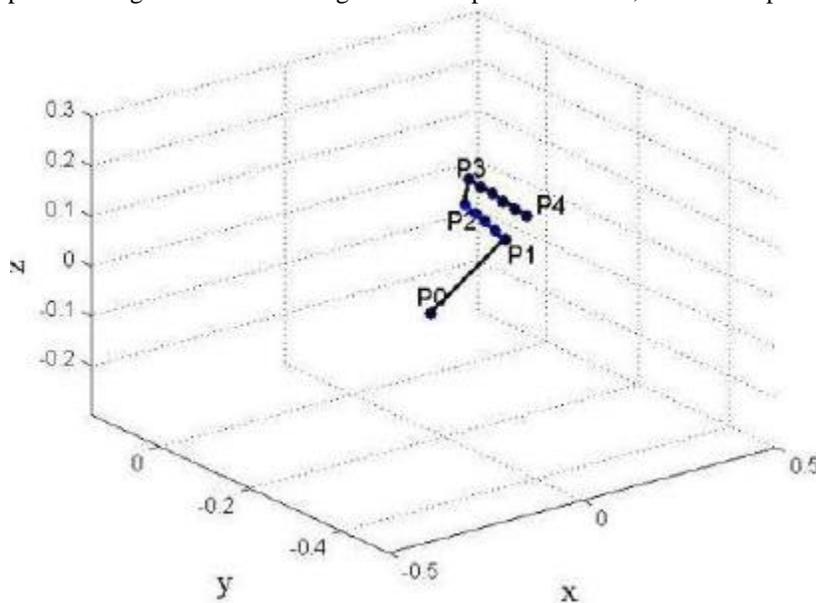


Fig. 4.6 Object grasping motion path

Can be seen from the diagram, under the condition of no obstacle constraints, arm motion path to linear form, according to the planning out of the path to the point, the control object grab robotic arm for operation.

The experimental results show that the obstacle constraints, NAO Successful completion of the robot to avoid obstacles Grab the target of the operation, verify the improvement in section in the previous chapter RRT *The reliability of the path planning algorithm.

V. Conclusion

As for robots and robot technology attaches great importance to both at china and abroad, and by robot is expected to release more labor, replace the tedious and repetitive work for human vision, makes the humanoid type service robot has become a hot research topic. Among them, the research on humanoid robot grab objects, the relevant domestic and foreign scholars have been in-depth study, this paper mainly studies the humanoid robot

NAO fetching operation of the object, aiming at the shortcomings of the camera is NAO robot ontology, sensors instead of robot body camera device is presented in this paper the depth perception environment, build a humanoid robot servo grab objects based on device system, has realized the robot grasping the operation of the object. In this paper, the main work is as follows:

(1) Introduces the knowledge of robot kinematics, using D-H to NAO robot arm Method and the robot kinematics equation is established the mathematical model, and by using analytical method of right arm was used to solve the inverse kinematics of robot, which laid a foundation for fetch the NAO robot objects.

(2) To achieve the target of the high precision robot objects, this paper designed a based on the device.

The humanoid robot grab target positioning system. First to image processing device for the scene information used to identify the target object and get the target detection center coordinates; And then set up the device and robot coordinate system, and constructs the bursa coordinate transformation model, and use the general linear least squares algorithm (LTLs) solve the model; According to device for center of the target position information, convert it to robot coordinate through coordinate transformation model, so as to realize the machine The person on the target object's position.

(3) To make the robots grasping objects fast, reliable, studied the robot arm motion path planning. For working space and the scope of work has clear guidance to the robot path planning, based on the analysis of the robot working space, by using iterative method and geometrical method to calculate the NAO Under the right arm robot in cartesian space of movement of scope. For NAO robot joints, the characteristics of high dimension space, using the improved RRT * algorithm for trajectory optimization, the grid search method with bidirectional search strategy is introduced into the original RRT * algorithm.

(4) For no obstacle and obstruction of constraint conditions, using it as a perceptual system, to verify the NAO robot can fetching objects of complete operation, set up different experimental environment, by combining the proposed target identification method, the application of the improved RRT * algorithm path planning for robot arm, by solving the inverse kinematics solution of the corresponding path points, and the results will be assigned to the robot, implements the fetch the robot operation. Through the above research, this article is based on To access humanoid robot servo system can realize the robot real-time grab objects, accurate and fast grab objects, mainly for the following three points : (1) on the humanoid robot NAO, based on the device object location experiment was carried out, the results show that this method has certain reliability and real-time performance, and NAO monocular vision positioning results were more accurate. (2) with the improved RRT * robotic arm motion trajectory planning algorithm, the experimental results show that this method not only retains the characteristics of RRT * gradually optimized, and the basic RRT algorithm and the programming efficiency of original RRT * algorithm is improved obviously, make the extension converges to the optimal price cost faster. (3) based on the presence of obstacles under the constraint condition of different object grab experiments, the results validate the correctness of this paper constructed the system as well as the use of the effectiveness of the method.

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Management of Gingival Melanin Pigmentation Using Four Different Techniques: A Split Mouth Study

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Abstract- Context: Dark or black coloured gum is one of the aesthetic concern of patients reporting to dental clinics. The normal colour of the gingiva is coral pink. Dark pigmentation of the gums occurs due to excessive melanin deposition in gingival epithelium which can be treated using several techniques. With this as the back ground our study was formulated with the objective to compare the treatment outcome of gingival depigmentation with four different techniques i.e. Er:YAG laser, Diode laser, scalpel abrasion technique and split thickness slicing using scalpel. 10 patients, with no systemic comorbidities visiting the OPD with concerns regarding unpleasant smile due to dark coloured gingiva were selected for the study. After thorough Phase-I therapy, split mouth depigmentation by four different techniques was carried out. Patients underwent depigmentation using Diode LASER at 910nm on the right lower quadrant, Er: YAG LASER on the right upper quadrant, Split thickness slicing procedure was employed on the left upper quadrant and surgical blade abrasion on the lower left quadrant using No 15 BP blade. Patients were evaluated for pain and discomfort for 7 days following surgery using VAS. Patients were evaluated for 28 days following healing and recurrence after 3 and 6 months. **Results:** Patient discomfort was lesser in scalpel side compared to LASER side. Healing was comparable with LASERS and Scalpel technique. Isolated recurrence of pigmentation was seen in the side with surgical scraping technique. **Conclusion:** LASERS are more effective as compared to conventional scalpel.

Index Terms- Depigmentation, Lasers, Scalpel

I. INTRODUCTION

The normal colour of the gingiva is coral pink [1]. However it is seen that part of the population is affected by dark coloured gingiva due to excessive melanin pigmentation produced by melanocytes present in the basal layers of the epithelial cells. This pigmentation is seen more prominent in certain ethnic groups [2] [3]. The excessive display of gums in patients with gummy smile and pigmented gingiva only add on to unesthetic appearance and social concerns for individuals.

The demand for esthetic surgery has grown by leaps and bounds in the recent years. Thus necessitating the development of techniques to alter the colour of the gingiva such as free mucosal grafts, scalpel abrasion, Split thickness slicing by scalpel, bur abrasion, cryosurgery, electro-surgery. Recently with the development of several laser systems: Erbium family of lasers,

Diode lasers, Nd:YAG lasers and CO₂ lasers has also proven efficacy in depigmentation [4].

One of the first techniques developed was the scalpel technique [4]. A portion of the sub epithelial connective tissue with complete epithelium was abraded and allowed to heal by secondary intention. The second technique being a split thickness slicing technique where the entire epithelium and a part of the sub epithelial connective tissue is sliced from the gingiva to expose the connective tissue and healing is achieved by secondary intention. This technique has been long referred to as “Gold Standard” in treatment of gingival pigmentation [5]. Recently, with the addition of lasers in the treatment modality for gingival depigmentation a lot of research has been directed towards this modality to compare with the existing modalities in terms of patient comfort and recurrence of pigmentation. Diode lasers and Er: YAG lasers are the choice amongst lasers for depigmentation procedures. All the available modalities have their own advantages and disadvantages. Recurrence being one of the major concerns [6]. Our study was aimed at evaluating the clinical outcomes by using two scalpel techniques and two lasers used for depigmentation procedures.

II. AIM & OBJECTIVES

To compare the treatment outcome of gingival depigmentation with two types of LASERS against two different types of scalpel techniques with the objectives to evaluate the level of post-operative discomfort, post-operative wound healing and the intensity and extent of recurrence of pigmentation.

III. MATERIAL & METHODS

The study was carried out in a Tertiary care government hospital. The study was carried out as a split mouth study on adult patients concerned with black coloured gums causing unesthetic smile. The duration of study was 6 months. Pre-clinical parameters include Dummett Gupta Oral Pigmentation Index score [2] and Hedin Pigmentation Extent Score [7]. The post treatment parameters include pain and discomfort to the patient using Visual Analog Scale [8], epithelial wound healing based on peroxide test [9], pigmentation score using Dummett Gupta Oral Pigmentation Index score [2] and Hedin Pigmentation Extent Score [7]. Surgical scalpel BP blade no 15 (Fig 1), Syneron Lite touch Dental Hard and soft tissue Er:YAG laser (Fig 2) and Dental diode laser at 980 nm wavelength (Fig 3).

Patient between the age group of 18 to 35 years with gender nonspecific, concerned about unpleasing smile due black gums, with good oral hygiene and willing for minor surgical procedure were included in the study population. Patients with thin gingival biotype chronic smokers and tobacco chewers, pigmentation associated with syndromes, uncontrolled diabetics, patients with auto-immune disorders, untreated periodontal conditions, patients on prolonged use of anti-malarial, tricyclic anti-depressants, oral contraceptive pills and minocycline therapy, patients with melanogenic tumors, pregnant or lactating women and non-compliant patients were excluded from the study

Ten Patients who came to the General OPD, who meet the inclusion and exclusion criteria, were selected and examined for participation in this clinical study. At baseline gingival pigmentation based on the Dummett-Gupta Oral pigmentation Index [2] and Hedin Oral Pigmentation extent index score was evaluated for the patients [7]. The descriptive data of the study population is given in Table 1 and the mean indices in Table 2.

Following Phase-I therapy, all selected patients underwent depigmentation procedure using the four different techniques in one sitting under adequate local anesthesia. The upper right quadrant was assigned for Er: YAG laser technique using brush stroke in contact mode, lower right quadrant was assigned for diode laser at 980 nm in contact mode and using brush stroke (Fig 4 & 5). The upper left quadrant was assigned to Split thickness slicing technique (Figs 6, 7 & 8) and lower left quadrant was assigned to scalpel abrasion technique. Bard Parker Blade no 15 was used for the scalpel techniques on the left side (Fig 9). The depigmentation procedure was carried out from central incisor to premolar region in all four quadrants. Gingival epithelia from the mucogingival junction to the marginal gingival was denuded and the interdental papilla also was included. Periodontal pack was placed at the site after procedure for 07 days. Oral hygiene instructions was given to all the patients. Restriction on consumption of hot and spicy foods for 01 week was advised and analgesics prescribed. Chlorhexidine mouth was (0.2%) was used for chemical plaque control for 01 week post-operative.

Post-operative evaluation of pain and discomfort was assessed using the Visual Analog Scale (8) after 4 hours, 24 hours, 7 days, 12 days and 21 days. Wound healing was assessed using the Hydrogen peroxide test as given by Merucha et al in 1998 [9]. On the 7th day after surgery the periodontal pack was removed and 3 % hydrogen peroxide was placed on the surgical wound. The presence of effervescence showed evidence of activity of the sub epithelial catalase enzyme that degrades H₂O₂ to release O₂ and thus the effervescence. This indicated the complete epithelial coverage of the surgical wound and hence completion of the wound healing process [9]. The patients were assessed for wound healing on all four quadrants using the peroxide test until the test result proved to be negative.

Post op the patients were then assessed after 6 months for recurrence (Fig 10 & 11). The Dummet Oral Pigmentation Index for intensity of pigmentation [2] and Hedin index for extent of pigmentation [7] was used to assess the recurrence in all four quadrants.

The data was collected and stored in MS Excel data sheet, the statistical analysis was carried out using IBM SPSS version 21.0 software.

IV. RESULTS

Post op evaluation of the patient discomfort was assessed using the visual analog scale after 4 hours when the effect of Local anesthesia wore out then after 24 hours, 7 days, 12 days and 21 days. The assessment was carried out using non-parametric equivalence of repeated measurements-ANOVA namely Friedman's Test. The results were plotted on a graph (Fig 12). It showed significant difference in values intra group in the different time periods ($p=0.001$). However inter group interaction was not significant. (Table 3)

Wound healing test was carried out using the peroxide test as described by Phillippe Merucha et al in 1998 [9]. The assessment as described in methodology aforementioned was carried out and a value of 1 was allotted to positive test i.e. presence of effervescence and 0 to negative result i.e. absence of effervescence. The values were statistically analysed using a chi-square test for 7 days, 12 days, 21 days and 28 days (Table 4). The results showed that at the end of 7 days when the epithelialisation is supposed to be completed, the side where scalpel was used showed 60% of patients with complete epithelialization whereas 30% of the laser side showed completion of epithelial formation (Table 4). After 12 days the scalpel side showed complete epithelialization in all patients and 70% of the patients showed complete epithelialization (Table 4). By day 28 the epithelialization was completed in all groups (Table 4). This showed a statistically significant variation in wound healing in the laser and scalpel groups. The scalpel groups showed faster wound healing as compared to the laser groups. In the inter scalpel group of scalpel stripping and scalpel abrasion there was no significant difference between the groups and between the laser groups i.e. diode laser and Er: YAG groups there was no significant difference between the groups.

The patients were evaluated after 6 months for recurrence of pigmentation and the assessment was carried out using the Dummett and Hedin indices for intensity and extent of repigmentation. The statistical analysis was carried out using Kruskal-Wallis test for independent samples. The analysis showed significant difference in recurrence amongst the groups. The scalpel groups showed faster incidence of recurrence as compared to laser groups. The laser group showed less intensity of the repigmentation as compared to scalpel group, pair wise comparison chart (Fig 13). There was significant difference between extent of intensity amongst the groups. The scalpel groups showed more extensive recurrence as compared to laser groups. However among the laser groups the Er: YAG group showed a statistically significant difference and lesser intensity of recurrence as compared to diode laser group, pairwise comparison chart (Fig 14), showing clinical evidence that Er: YAG laser is more effective than diode laser or scalpel techniques for reducing recurrence of pigmentation.

V. DISCUSSION

Melanin is synthesized in the supra-basal layers of the epithelium by the melanocytes which contain organelles called pre-melanosomes. These pre-melanosomes contain the enzyme tyrosinase which hydroxylates tyrosine to Di-hydroxy-phenyl alanine which is converted to pre-melanin and eumelanin. The

melanophores and melanophages phagocytose these pigments and are present in the epithelium.

Several modalities exist for the treatment of pigmentation such as free gingival autografts, cryosurgery, electro-surgery, scalpel abrasion and split thickness slicing, Lasers and chemical such as 90% phenol. However, these methods have their own disadvantages. Free mucosal graft has its inherent disadvantages of having a variation in the colour of the graft and adjacent tissues and a second surgical site morbidity [10]. The depth of depigmentation achieved is not predictable using cryo-surgery and chemical methods. The disadvantages of the electro-surgery being the heat dissipation and thermal damage to adjacent tissues and bone, if the depth is not controlled [10].

Scalpel abrasion is the simplest method, with control over the depth of abrasion and being less technique sensitive. The split thickness slicing has an advantage of predictable depth of the de-epithelialisation. However, the technique needs to be performed on thick gingival biotype as there is risk of exposure of the roots and the underlying alveolar bone. This is a highly technique sensitive method and is time consuming. Both the scalpel techniques have the disadvantages of excessive bleeding and requires the placement of periodontal pack.

Er: YAG and diode lasers are new additions to the laser family. Er:YAG functions on the principle of ablation of the cells by absorption of laser photons by water molecules. Thus, causing explosion of these water molecules in the cells and thus cellular ablation [11]. Diode laser functions on the principle of absorption of laser photons by pigments and subsequent ablation of the cells.

Pain and discomfort experienced by the patients analysed on Visual Analog Scale is a subjective assessment. This scale is charted on a scale of 100mm [8]. Several Studies have shown that pain and discomfort was comparatively lesser with use of lasers as compared to scalpel [12] [13][14][15]. Our study showed a slightly higher discomfort on the laser side as compared to the scalpel groups. However, the over-all reduction in pain was comparatively similar in all groups.

Depigmentation procedure is undertaken by de-epithelialization of the gingiva by split thickness slicing or abrasion. During this process the epithelium is completely scrapped off with a part of the sub epithelial connective tissue. Epithelium generally regenerates by the seventh day and forms the normal barrier [16]. Complete epithelialization blocks the activity of sub epithelial connective tissue enzyme catalase that degrades hydrogen peroxide to water and oxygen showing effervescence when applied over open wounds. This test proves the completion of epithelial barrier as described by Phillipe Marucha et al in his study in 1998 [9]. Our study used 3% H₂O₂ to check the integrity of the epithelial barrier. Lasers due to their ablative nature on the cells have shown slower wound healing as compared to scalpel technique [17] and this has been confirmed by our study.

Recurrence of pigmentation has been a cause of concern amongst patients, clinicians and researchers. The exact cause or mechanism of recurrence is not known, however it is hypothesized that the melanocytes which are present in the adjacent sites can cause recurrence of pigmentation. However, the intensity and extent of repigmentation is questionable and variable in different patients [6]. Studies have shown consistent recurrence in pigmentation after several months [18]. Our study showed comparative results as shown in the aforementioned results.

Comparison of diode laser and Er: YAG showed statistically that Er: YAG group showed lesser extent of pigmentation as compared to the diode laser group (Fig 8).

VI. CONCLUSION

Depigmentation of gingival pigmentation has been one of the clinical necessities of the modern day practice of Perio-Esthetic procedures. With the advent of lasers as a new tool at the hands of the clinician, depigmentation procedures has become less technique sensitive procedure with predictable and long term success rates. Recurrence is a cause of concern to many clinicians however the extent and degree of repigmentation seen in the scalpel and laser groups show significant difference with the balance tipped towards the laser group especially Er: YAG as shown in our study. Though split thickness slicing has been considered for long as a "Gold Standard" [5] the newer modalities such as lasers are now considered superior in clinical outcomes [19].

Within the limitations of our study, the effectiveness of Er: YAG laser has shown clinically and statistically significant results favouring the modality. However, a large scale randomized controlled trial and systematic review of the several modalities in split mouth study design is warranted to establish the clear cut advantage of Er: YAG lasers over other lasers and modalities of depigmentation of gingiva.

APPENDICES

Appendix 1: Tables 1 through 4

Appendix 2: Figures 1 through 14

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Appendix 1: TABLES

PATIENT POPULATION

	Frequency	Percent	Valid Percent	Cumulative Percent
Females	8	80.0	80.0	80.0
Males	2	20.0	20.0	100.0
Total	10	100.0	100.0	

Table 1: Gender wise Descriptive Analysis of Study Population

AGE DISTRIBUTION

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	10	18	39	27.90	7.578

Table 2: Age distribution of the study population

Descriptive Statistics: VAS Scores				
VAS (Time PostOp)	Method	Mean	Std. Deviation	N
VAS (4hrs)	Split thickness	3.60	.699	10
	Scalpel Abrasion	3.60	.699	10
	Er: Yag Laser	4.10	.876	10
	Diode Laser	4.10	.876	10
VAS (24hrs)	Split thickness	1.80	.789	10
	Scalpel Abrasion	1.80	.789	10
	Er: Yag Laser	2.60	1.075	10
	Diode Laser	2.60	1.075	10
VAS (7 Days)	Split thickness	.40	.516	10
	Scalpel Abrasion	.40	.516	10
	Er: Yag Laser	1.20	.919	10
	Diode Laser	1.20	.919	10
VAS (12 Days)	Split thickness	.10	.316	10
	Scalpel Abrasion	.10	.316	10
	Er: Yag Laser	.10	.316	10
	Diode Laser	.10	.316	10
VAS (21 Days)	Split thickness	.00	.000	10

	Scalpel Abrasion	.00	.000	10
	Er: Yag Laser	.00	.000	10
	Diode Laser	.00	.000	10

Table 3: Statistical Data of VAS scores at different intervals

TECHNIQUE	7 DAYS NEGATIVES	7 DAYS POSITIVES	12 DAYS NEGATIVES	12 DAYS POSITIVES	21 DAYS NEGATIVES	21 DAYS POSITIVES	28 DAYS NEGATIVE	28 DAYS POSITIVES
Split thickness slicing	60%	30%	100%	0%	100%	0%	100%	0%
Scalpel Abrasion	60%	30%	100%	0%	100%	0%	100%	0%
Er: YAG Laser	30%	70%	70%	30%	80%	20%	100%	0%
Diode Laser	30%	70%	70%	30%	80%	20%	100%	0%

Table 4: Wound Healing Test results on Chi-square test

Appendix 2: FIGURES



FIG 5: Depigmentation using Diode laser on the right side lower quadrant



FIG 6: Incision for split thickness slicing



FIG 7: Excised portion of split thickness slice from the mucosa



FIG 8: Shows de-epithelialised gingiva of the upper left quadrant



FIG 9: Shows depigmentation by scalpel abrasion technique by Bard Parker blade no. 15



Baseline



6 months Post-operative

FIG 10: Shows comparison at baseline and post-operative recall 6 months later on the laser side

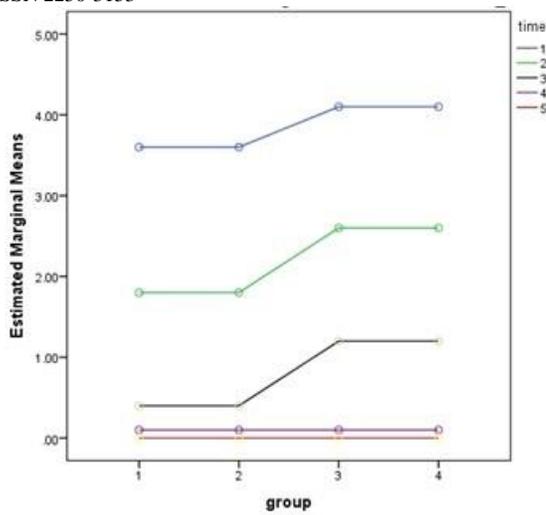


Baseline



6 months Post-operative

FIG 11: Shows comparison at baseline and post-operative recall 6 months later on the scalpel side



X-axis: Groups:

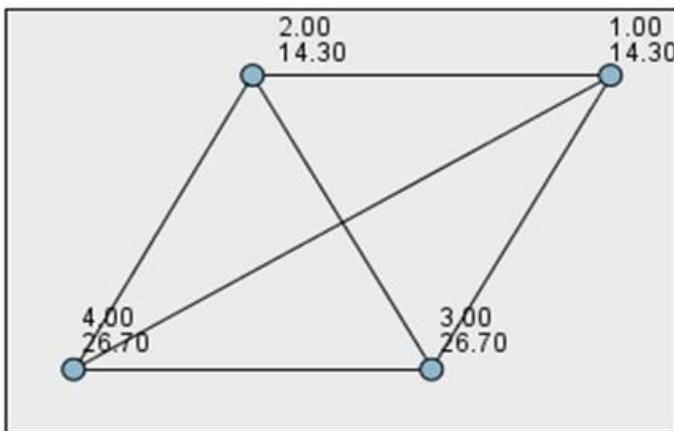
- 1: Split Thickness Slicing
- 2: Scalpel Abrasion
- 3: Er:YAG Laser
- 4: Diode Laser group

Y-axis: Pain scores on VAS scale

Time

- 1: 4 hours post-op
- 2: 24 hours post-op
- 3: 7 days post-op
- 4: 12 days post-op
- 5: 21 days post-op

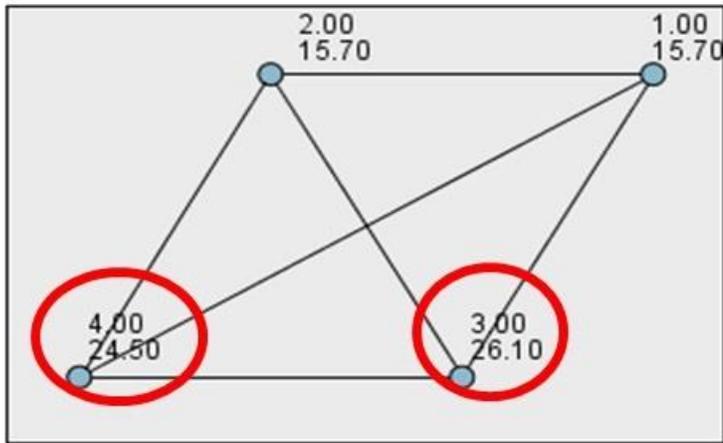
FIG 12: Shows the graphical representation of the reduction of Pain in the various groups plotted along the X Axis and time periods on the Y axis by estimated marginal means of measures



Legend:

- 1.00: Split thickness slicing technique
- 2.00: Scalpel Abrasion technique
- 3.00: Er:YAG laser technique
- 4.00: Diode lase technique

FIG 13: Shows the graphical representation of the intensity of recurrence of pigmentation amongst the groups after 6 months: 1-Split thickness slicing, 2-scalpel abrasion, 3- Er: YAG laser abrasion and 4-Diode laser abrasion by pairwise comparison of method categories



Legend:

- 1.00: Split thickness slicing technique
- 2.00: Scalpel Abrasion technique
- 3.00: Er:YAG laser technique
- 4.00: Diode laser technique

FIG 14: Shows the graphical representation of the extent of recurrence of pigmentation amongst the groups after six months: 1-Split thickness slicing, 2-scalpel abrasion, 3- Er: YAG laser abrasion and 4-Diode laser abrasion by pairwise comparison of method categories- clearly indicates the difference in Er: YAG group vis-à-vis diode laser group.

Is There a Relationship Between Work Locus of Control and Interpersonal Conflict at Work

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Abstract- Businesses are always looking for ways to increase their competitive edge which is why much attention is directed toward an individual's functioning and how it can affect organizational functioning. Interpersonal conflict can greatly impact how an individual functions (Rispen & Demerouti, 2016). Conflict can reduce productivity through decreased communication, time spent to resolve the conflict, and employees focusing on conflict rather than accomplishing their duties. This research study will examine if there is a correlation between work locus of control and perceived interpersonal conflict. How an employee interprets work events-work locus of control contributes to how they function. Individuals are said to possess an internal or external locus of control. The construct is measured on a continuum. A survey completed using convenience snowball sampling was used to measure attitudes and beliefs in the workplace. A total of nine constructs were measured using scales proven to be reliable and valid. The sample used in this study consisted of 871 respondents. Results indicate a slight positive correlation. If employers can find ways to decrease interpersonal conflict and the negative consequences associated with it, they can improve their organization's effectiveness and productivity.

Index Terms- Counterproductive work behavior, emotional intelligence, perceived interpersonal conflict, work locus of control

I. INTRODUCTION

It is no secret that technology, advances in transportation, and a more mobile population have connected the world. As businesses become more global and competitive, it is important to help employees perform at their best. Industrial/Organizational psychologists are concerned with improving the overall functioning of the work world. Their goal is to analyze the current functioning of a work environment and make recommendations to increase success and performance levels. This might be accomplished by increasing the rate at which work is performed, increasing the quality of work performed, or helping an employee function in a more productive way. This paper will examine the relationship of two constructs, perceived interpersonal conflict and work locus of control. Identification of strategies to minimize interpersonal conflict is one way to reduce loss, thereby increasing profit, the ultimate goal of businesses.

There are very few occupations that do not require interaction with others to accomplish the tasks of the position. These interactions between individuals often lead to interpersonal conflict, referred to as interpersonal conflict at work (ICW). Consulting Psychologists Press, Inc. (2008) presented a report on workplace conflict that gathered information from nine countries. A staggering 85% of employees report dealing with interpersonal conflict. Those who answered that they dealt with conflict always or frequently was 29%. US employees were found to spend an average of 2.8 hours a week dealing with conflict. In terms of dollars, that's \$359 billion in paid hours for the year 2008. This does not take into account the absences that 25% reported taking to avoid workplace conflict (Consulting Psychologists Press, Inc., 2008).

Julian Rotter (1966) is credited with developing the idea of locus of control within his social learning theory. In simple terms, locus of control refers to how one perceives events and their personal relationship to these events. Locus of control is split into internal and external. A person with an external locus of control feels they have little control over events that happen in their life. A person with an internal locus of control views life events as a function of the decisions they have made. It should be noted this construct is measured on a continuum (Rotter, 1966). Paul Spector developed a scale that measures the construct of locus of control as it specifically relates to work. This scale is referred to as the Work Locus of Control Scale, (Spector, 1988).

The research that is available often lumps interpersonal conflict in with other work behaviors that are viewed as negative (Jaramillo et al., 2011). The literature reviewed dealing with work locus of control seems to concentrate on job performance and or job satisfaction (Shannack & Al-Taher, 2012; Rizeanu, 2016; Chen & Silverthorne, 2008). Or locus of control is used in relationship to overall negative behaviors (Turnispeed, 2018; Sprung & Jex, 2012). There was some research that examined interpersonal conflict as a part of the emotional intelligence construct (Greenidge, 2014; Moeller & Kwantes, 2015). It is hoped this paper will contribute to the literature in advancing the knowledge base of how to best achieve a highly functioning work environment with minimal negative features that are counterproductive to the success of the organization. Interpersonal conflict has many negative effects. When psychological stress is experienced, it can have physical effects. Muscatell et al. (2015) in researching the neural activity that is associated with inflammation found both increased neural

activity and increase in inflammation were associated with stress (Muscatell et al., 2015). Research completed by Girardi et al. (2015) studied the effects that ICW had on biomarkers of inflammation. Results indicate that work-related stress is likely associated with inflammation (Girardi et al., 2015). A study conducted by Narayanan, Menon, and Spector (1999) used an open-ended technique to examine stressful incidents for three different occupations: clerical workers, university professors, and sales associates. Participants from all three of the occupations studied reported interpersonal conflict at work as a stressor. Sales associates and university professors reported interpersonal conflict at work as a major stressor, (Narayanan et al., 1999). Jaramillo, Mulki, and Boles (2011) conducted an empirical literature review to look more closely at the effects of interpersonal conflict on organizational outcomes. They chose to use data collected using salespeople specifically because salespeople tend to have more interpersonal interactions, needing to interact not only with customers, but members of their sales team as well. Role stress was found to significantly affect work overload perception which led to higher interpersonal conflict. They reported interpersonal conflict significantly impacted emotional exhaustion, even after the direct impact of role stress on emotional exhaustion was controlled (Jaramillo, et al., 2011). Meier, Semmer and Gross (2014) conducted a study in Switzerland. Their goal was to examine the moderating effect that depressive symptoms would have on interpersonal conflict and an individual's well-being. Included in the study were indicators of both physical and psychological well-being. Their results were based on two studies: cross-sectional (n=218) and a two-week diary study (n=127). After analysis, they determined that conflict was related to both physical and psychological symptoms of impairment, (Meier et al., 2014). When individuals with little social support experienced social stressors over several months, depressive symptoms were found to increase, (Dorman & Zapf, 1999). Research conducted on the effects of interpersonal conflict completed by Ilies, Johnson, Judge, and Keeney (2011) found short-term negative effects on emotion related to interpersonal conflict at work (Ilies et al., 2011). Meir, Gross, Spector, and Semmer (2013) reported a negative effect on emotions related to interpersonal conflict at work as well (Meir et al., 2013).

The occurrence of ICW is set to increase. The movement toward decentralization and fewer organizational layers, increased diversity, and a growing need to coordinate work activities makes the work environment ripe for increased conflict, (Dijkstra, Beersma, & Cornelissen, 2012). In researching the moderating effects of coping mechanisms on the relationship between negative emotion and work performance, Brown, Westbrook, and Challagalla (2005) found that performance was affected by emotion (Brown et al. 2005).

There is an abundance of research regarding stress associated with work; much of it focuses on identifying the elements that have a moderating effect on stressors and allow the individual to limit his or her focus on the negative results associated with it (Rispen & Demerouti, 2016; Sprung & Jex, 2012). Most of the research can be placed in one of two categories; those aimed at identifying the traits one possesses (Moeller & Kwantes, 2015; Ilies et al., 2010) and those aimed at identifying strategies that will reduce the stress (Brown et al.; Wright et al., 2015).

Eschleman, Bowling, and LaHuis (2015) is just one example of research that examines the moderating effects of personality. They found that low-agreeableness was related to higher levels of counterproductive work behavior when work stressors (interpersonal conflict and organizational constraint) were increased, (Eschleman et al., 2015).

Conflict detachment is an example of a coping tactic. Rispen and Demerouti (2016) completed a study that looked at the effect that conflict detachment had on an individual's response to conflict. They base their theorizing on previous research by Sonnenetag and Fritz (2007) and Sonnentag and Bayer (2005). Rispen and Demerouti hypothesized that the ability to psychologically detach from the conflict would moderate the negative emotions induced by the conflict. This hypothesis was supported by their results (Rispen & Demerouti, 2016). Studying locus of control and the ability to detach would be worthy of future research.

A study conducted by Norris and Niebuhr (1984) looked at the role that locus of control played on job satisfaction and job performance. They utilized information gathered from 116 respondents working in the engineering department of a medium-sized industrial company. All participants held a technical position. It's interesting to note that of the 116 respondents, 106 were male. It is unclear if the results were skewed by a predominantly male sample. Levels of job performance and job satisfaction did not significantly differ between those with an internal locus of control and those with an external locus of control. But those with an internal locus of control showed a more significant relationship between job satisfaction and job performance (Norris & Niebuhr, 1984).

Work locus of control is an aspect of personality that has been demonstrated to effect organizational behavior. An internal locus of control leads employees to believe more powerfully than externals that their behavior will have influence. Those who possess a more internal locus of control are more likely to engage in political behavior. They are better able to control their behavior (Shannack & Al-Taher, 2012). Mohapatra and Gupta (2010) found a significant correlation between locus of control and emotionally intelligent behaviors in managers (Mohapatra & Gupta, 2010).

Rizeanu (2016) conducted a study that looked at stress, emotional intelligence, and locus of control as predictors of work satisfaction. Participants were 110 students in psychology at a university in Bucharest. The students completed several specialized instruments that measured stress, emotional intelligence, locus of control, and work satisfaction independently. By using a stepwise multiple regression, it was found that while stress and emotional intelligence predicted job satisfaction at a relatively significant level. When locus of control was added to stress and emotional intelligence as predictive factors of job satisfaction, the predictive value for job satisfaction increased, (Rizeanu, 2016).

In an overall effort to provide an education that would improve social work student's ability to be successful and the likelihood a social worker would remain in a public agency, the California Social Work Education Center (CalSWEC) initiated a study. Social workers in a public agency are faced with several challenges and display a high turnover. They must provide services to meet the needs of their clients while adhering to strict

policies and ensuring children are protected. They must determine how scarce resources are to be distributed. Fitzgerald and Clark (2013) focused on work locus of control as a construct that would influence how social workers reacted to these stressors, noting that some seemed to thrive in this environment. Their research generally supported their hypotheses regarding social workers with an external locus of control. They placed less emphasis on employment outcomes, felt less responsible for client outcomes, and tended to perceive their part in positive outcomes as unrelated to their own job performance (Fitzgerald & Clark, 2013, p59).

Interested in researching the moderating effect of work locus of control on work stressors and counterproductive work behavior (CWB), Sprung and Jex (2012) designed a research study. They studied 191 working adults. The sample came from different occupations. They found employees possessing an internal locus of control had a weaker relationship with organizational constraints and CWB, (Sprung & Jex, 2012). In looking at how employees use CWBs as a coping strategy, Shoss, Jundt, Kobler, and Reynolds, (2016) found that locus of control had a predictive value in determining if a CWB would be an effective coping mechanism. CWBs were seen to be an effective coping strategy at a higher rate for those with an external locus of control than for those with an internal locus of control, (Shoss et al., 2016). Utilizing healthcare workers, Dijkstra, Beersma, and Evers (2011) examined internal locus of control as a moderating factor between conflict-related strain and problem-solving strategy. They found that internal locus of control did have a moderating effect on these two variables. In addition, they found people with an internal locus of control were more likely to use some type of conflict management strategy, thus reducing the strain induced by the conflict, (Dijkstra, Beersma, & Evers, 2011). Interested in the relationship between emotional intelligence, work values, and internal locus of control, Mohapatra and Gupta (2010) hypothesized that emotionally intelligent managers will have high work values and high internal locus of control. It was confirmed by their study. Additionally, they found internal locus of control correlated significantly with self-managing and utilization of emotions, as well as social skills (Mohapatra & Gupta, 2010). By showing a relationship between work locus of control and interpersonal conflict, further strategies can be employed to help employees achieve an internal locus of control.

Method

Participants

Subjects were recruited using convenience sampling via emails and social media. The purpose of the survey was to assess attitudes and beliefs related to work. With that in mind, students asked that participants be 18 years old and have some work experience. The survey was posted online in English, Spanish, Dutch, and Portuguese. A total of 1686 respondents completed the survey. Deletions were made to the raw data based on participant age, inappropriate responses, and issues with the measurement scales when translated into languages other than English. After all deletions, only the data obtained from the survey in English was used for this study, giving a total sample of 871. This study was part of a larger study.

Materials

Materials utilized consisted of an electronic way to access the survey and the survey itself. Participants were asked to complete the survey online, as well as forward the survey link to others. The survey, first obtained demographic information: age, gender, sexual orientation, marital status, number of children, current highest level of education, category of current position, employment status, number of years at current job, annual income, number of incomes in household, racial identity, and ethnic identity. Participants were asked to provide information related to nine different constructs. All constructs were measured using scales that have been validated and demonstrated reliability.

Locus of control was measured using Spector's abbreviated eight item Likert scale (Spector, 1988). Possible responses were disagree very much, disagree moderately, disagree slightly, agree slightly, agree moderately, and agree very much. The appropriate scores were reversed per Spector's scale instructions. Higher scores on this scale indicate a more external work locus of control. Interpersonal Conflict at Work was measured using Spector's four item Likert scale (Spector & Jex, 1998). Higher scores on this scale indicate someone who perceives more interpersonal conflict. Possible responses were strongly disagree, slightly disagree, neither agree or disagree, slightly agree, and strongly agree.

Results

Of the 871 respondents used, 551 were females, 316 were males, and the remaining answered with prefer not to answer or transgender. Because the pretest check of normality was not met for ICW, the Spearman correlation was used. A slight positive correlation ($r=.214$) that is statistically significant, $p < .0001$ was found. One limitation is that data collected relied on self-reporting.

Conclusion

Our world is becoming ever more connected through technology, modernization of travel, and the fact that many live and work outside their native country. Businesses are always concerned about the bottom line-how much profit can be made. Taken collectively, research examining organizational functioning has demonstrated that how well an individual functions has an impact on organizational outcomes. Organizations interested in improving their employees' functioning are beginning to provide training to address not only technical skills needed to perform duties, but those that will help lead to a positive work environment and positive work behaviors. This study contributes to the research that work locus of control influences employees' behaviors and perceptions. Further research into ways to increase one's locus of control would be beneficial to the field of industrial/organizational psychology. Teaching employees to utilize a more internal locus of control can reduce counterproductive work behaviors and increase positive outcomes.

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Visualizing data using Lattice in R and Seaborn in Python for data science

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Abstract- Visualization is the graphical representation of information and data. Using visual elements visualization tools helps understand trends, patterns and outliers in data with minimum complexity. There are two types of data visualizations, Univariate visualizations helps understand the distribution of a single variable and Multivariate visualization expresses the relationship between multiple variables. In a world of big data visualizations are crucial to make data-driven decisions by analyzing massive amounts of data. Many visualization methods such as scatter plots, bar charts, histograms, line charts, and pie charts, are widely used to tell stories removing the noise from data and zero in on the useful information. The better you convey your points visually, the better you can leverage that information.

Index Terms- Contrast between Lattice and Seaborn with the support multivariate plots, contrast between Lattice and Seaborn with the support of univariate plots for data science.

I. INTRODUCTION

Lattice is a data visualization library of R. Lattice is an application of Trellis graphics, framework for data visualization which is an elegant visualization system with prominence on multivariate data visualization. Lattice is a package for data visualization in R which is recognized as a key component in the R data science stack.

Seaborn is a library built on prime of Matplotlib. It allows one to make their visualizations prettier, and provides us with some of the common data visualization needs (like mapping a color to a variable or using faceting). Seaborn is more integrated for working with Pandas Data Frames.

Both the libraries are easy to understand and implement in their own field of usage. Seaborn has a straightforward syntax

III. UNIVARIATE PLOTS

This type of plot is very easy to comprehend and used mostly worldwide containing plots like bar plot, histograms, box plots and many more. They help show the data and summarize its distribution. It describes observations for an individual variable. Also called as one variable at a time plot.

whereas for matplotlib there is more complexity with more variables to be defined depending on the user's requirements.

In addition, the published research work also provides a big weight-age to get admissions in reputed varsity. Now, here we enlist the proven steps to publish the research paper in a journal.

The remainder of the paper is as follows:

- 1) Section 2: Data Overview
- 2) Section 3: Multivariate Plots
- 3) Section 4: Univariate Plots
- 4) Section 5: Conclusions

II. DATA OVERVIEW

The datasets used for this research purpose are self-made or self-generated. The same dataset has been used for fair comparison between the two libraries of python. This dataset is related to red variants of the Portuguese "Vinho Verde" wine.

Contents:

Input variables (based on physicochemical tests):

- 1 - fixed acidity
- 2 - volatile acidity
- 3 - citric acid
- 4 - residual sugar
- 5 - chlorides
- 6 - free sulfur dioxide
- 7 - total sulfur dioxide
- 8 - density
- 9 - pH
- 10 - sulphates
- 11 - alcohol

Output variable (based on sensory data):

- 12 - quality (score between 0 and 10)

A. Histogram/Density Plot

A Histogram lets you come upon the spread of frequency of a set of continuous data. Allows inspection of underlying distribution.

Figure 1.1 – Histogram with Seaborn

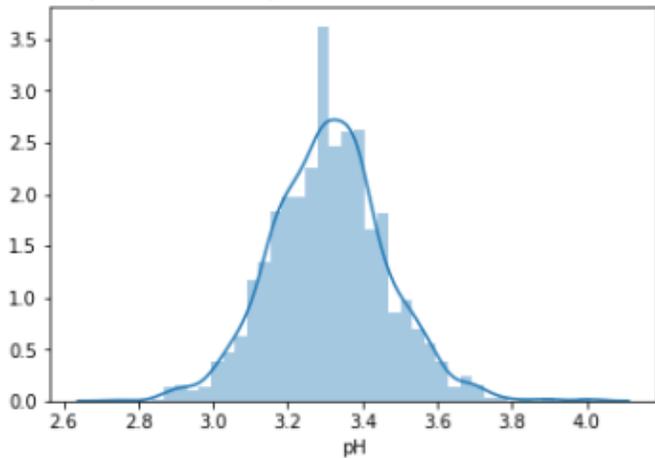
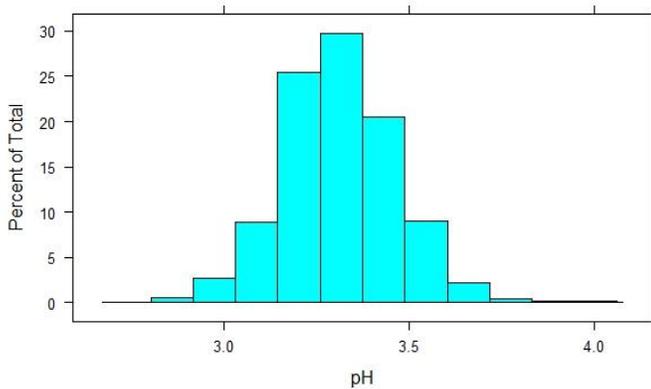


Figure 2.2 – Histogram with Lattice



Given similar datasets to the 2 libraries, we see that lattice’s visualization concentrates more on how the data is spread whereas in the visualization by Seaborn, primary focus is on where the spread of data is thick, with the line known as the KDE or Kernel Density Estimate along it, the visualization is able to show how the course of the distribution is.

B. Box Plot/Whisker Plot

Box and whisker plots display the 5 – number summary of a set of data. 5 parts:

- Minimum
- First Quartile
- Median (Second Quartile)

- Third Quartile
- Maximum

Box plots graphically summarize groups of data through their quartiles.

Figure 2.1 – Box Plot with Seaborn

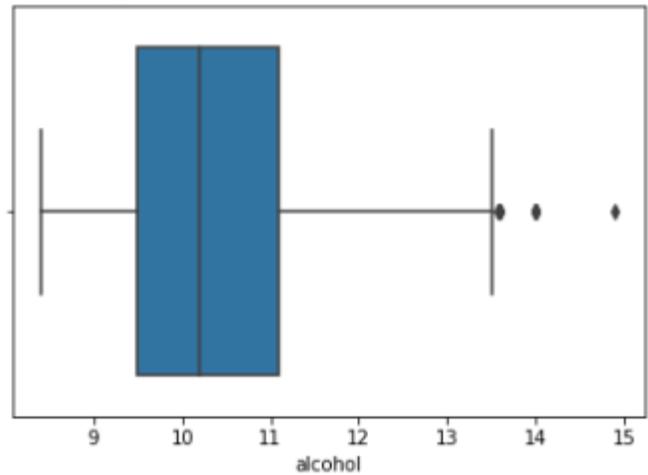
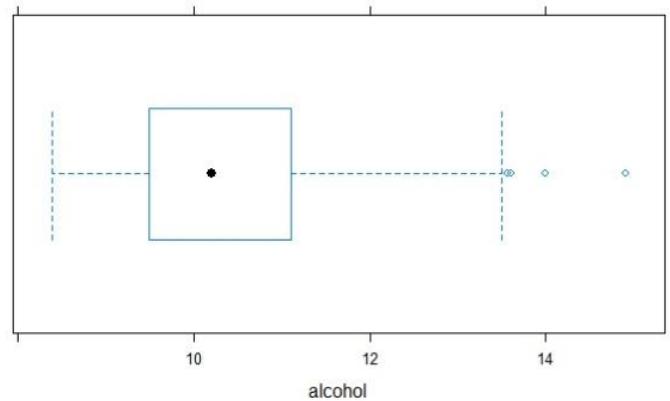


Figure 3.2 – Box Plot with Seaborn



When both libraries are provided with the same dataset the lattice’s visualization the median is represented by a dot with big intervals on x-axis whereas the visualization with Seaborn color’s itself and represents the median by a line and with small intervals on x-axis making the plot easily graspable and captivating.

IV. MULTIVARIATE PLOTS

Multivariate visualizations include the much commonly used scatter plot, heat maps, cluster maps and much more.

A. Scatter Plot

This represents values using dots for 2 different variables. This method of plotting using dots gives the concentration of data.

Figure 3.1 – Scatter Plot with Seaborn

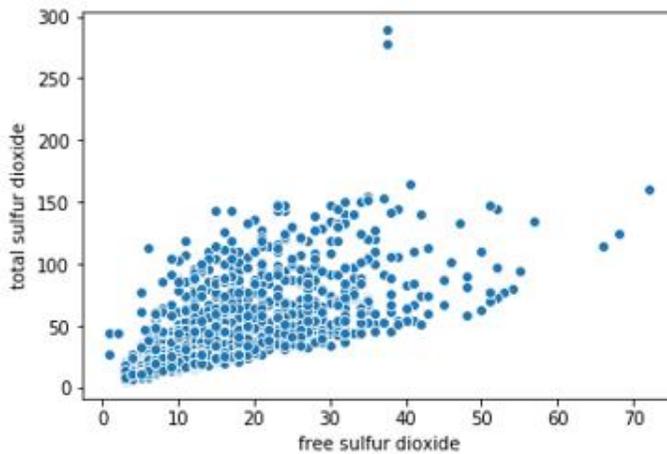
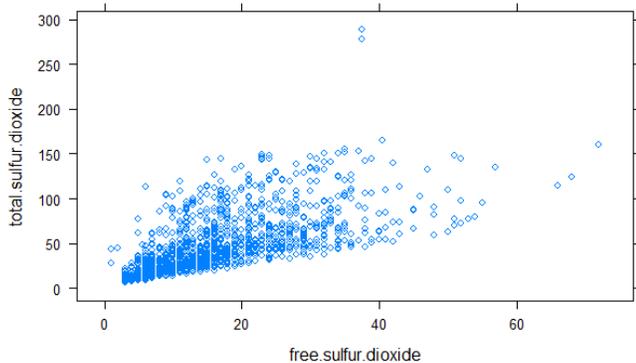


Figure 3.2 – Scatter Plot with Lattice



With the same dataset provided the lattice's visualization has high complexity with less visibility of the dots due to extensive overlapping whereas Seaborn provides us with presentable visualization providing colored dots with better visibility.

B. Heat map

It is a very effective plot where individual values in a matrix are displayed as colors. one can understand the occurrence density of data around an observation. Used often to understand the correlation of the data values.

Figure 4.1 – Heat map with seaborn

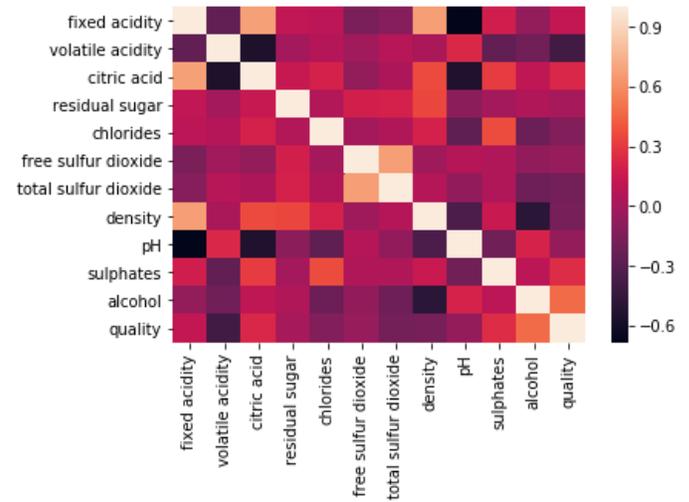
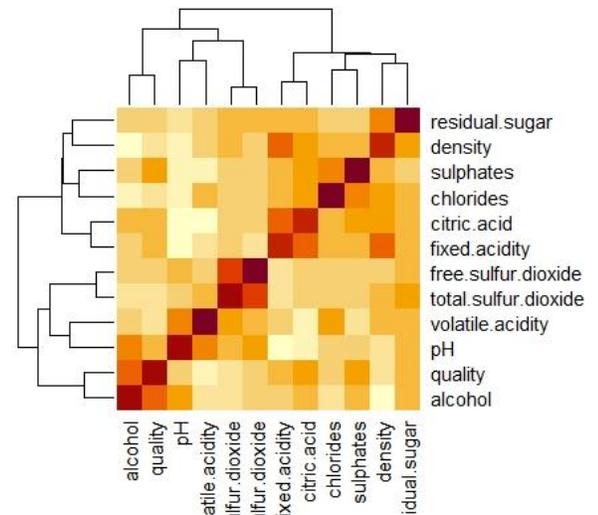


Figure 4.2 – Heat map with lattice



Whereas the heat map generated by lattice is poorly detailed and not presentable. Provides us with an hierarchical relationship between values.

V. CONCLUSION

Both the libraries seaborn and lattice are beneficial for visualization of data. Both the libraries produce a simple visualization quickly but when a clear-cut, presentable and explicit visualization is required, Seaborn is a cut above lattice providing each and every trivial characteristic for finer cognizance of the visualization.

Lattice works more with light visualization tools.

To create trailblazing visualizations seaborn could be used. Seaborn provides much more detailing upon the visualizations considering the dataset whereas lattice does not provide that much details under default state. Seaborn requires less effort for producing an explicit visualization compared to lattice which requires much more effort to produce an intricate visualization covering each and every minor detail.

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An investigation on the extent to which Gender Based Violence influences the Enforcement of Gender Policies in Education in Narok County, Kenya

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Abstract

In recent years, governments in many parts of the world have been attaching importance to gender issues. The Kenya government through the ministry of education and gender has been working hand in hand to address gender issues in education. The government has put in place measures to ensure equity, access, retention, completion and transition. These efforts have not yielded much as Gender Based Violence (GBV) most of it cultural and other factors continue to deny girls education. The study was guided by cultural lag theory by William Ogburn. The purpose of the study was to establish the extent to which GBV influences the enforcement of Gender policies in Education in Narok County, Kenya. The study adopted the ex-post-facto survey and descriptive survey design. Samples were drawn using stratified, simple random, purposive and systematic sampling. Questionnaires, interview schedule and focus group discussions were used to collect data. Quantitative data were analyzed through descriptive statistics such as frequency percentages and correlation statistics. Qualitative data were transcribed and discussed based on established themes. The study found out that the main reason for girls dropping out of school was early marriage. Other factors forcing girls out of school were illiteracy among parents, early pregnancies, poverty and large families that made it difficult to provide girls with basic necessities. The study recommends full enforcement of laws made to protect girls and follow up on the implementation of Gender Policies in Education. Further the study recommends increase in human and financial support to ensure close monitoring, more funding for girls schools and more boarding schools for girls. Education for girls should also be made flexible to enable them deal with domestic chores.

Index Terms: Gender, Gender Based Violence, Gender Policies, Education, Enforcement.

INTRODUCTION

Gender Based Violence (GBV) mainly cultural remains one of the major challenges in the realization of gender equity and equality. Gender identities and gender relations are crucial aspect of culture because they shape the way daily life is lived in the family, in the community, work place and even in education institution. Cultural beliefs and practices influences the societal perception of each gender (Schlkwyk 2000). Cultural practices and unfounded norms are a more complex issues affecting girls and women thus depriving them their rights and opportunities to participate in the development process of the society.

Education refers to learning to be human and any human being in any society regardless of sex or gender must be exposed to education. Education attained by the child is valuable since it adds to the welfare of house hold and to the development of the nation. Education in general is made to promote human dignity and afford opportunity and equity in distribution of wealth. Education has also been seen as an effective weapon to fight ignorance, poverty and diseases which are the root Cause of

discontent throughout the world .It creates choices for people and gives a strong voice in the society (Millennium Development Goals 2000).

Many conferences and conventions have been held all over the world to ensure education for all with more emphasis on the girl child education. The world conference on Education for All (EFA 1990) aimed at eliminating all obstacles to enable girls and women to get quality education. The 1993 Ouagadougou declaration and frame work for action emphasized on education of the girl child and called on all government to establish it as a priority. The conference on population in Cairo 1994 emphasized on the importance of female education. In the African platform for Action 1994 outlined policies such as early childhood education, lifelong skills, adult literacy, gender equality in education and quality education.

Among the eight Millennium Development Goals (MDGs), MDG number 2 was on education. Education for All which is a global movement led by UNESCO aimed at meeting learning needs for all children youth and adults by 2015. In 2004 UNESCO report "Global human rights standards" mandated that education be free so that it can later be made compulsory to all children. The main aim was to ensure every child gets primary education which is considered basic as well as subsidized secondary education. Among the 17 Sustainable Development Goals (SDGs), goal 4 aimed at ensuring inclusive and equitable quality education and ensure lifelong learning opportunities. The 1996 OAU Conference main theme was empowerment of women through education.

Kenya is a signatory to the above aforementioned conventions and declarations and is committed to achieving the agreements of the conventions. Government policy of Free Primary Education (FPE) in 2003 gave extra support to girl child education in conformity with Education for All by 2015. FPE program seeks to empower both boys and girls hence offering female gender a fair opportunity. Free day secondary education policy was adopted in Kenya in 2008 to increase enrolment. The Kenya National Gender Policy (2007) highlights key gender concerns in education such as disparities in enrolment, retention, transition rates, negative social-cultural practices and attitudes, which inhibits especially girls' access to school and drop out of school due to pregnancy and early marriage. Its intents were to have a framework for designing and implementation of the various gender-responsive education sector, programs such as measures to raise the level of gender parity at all levels of education.

Education in Kenya is aligned with the constitution. The 2010 constitution of Kenya chapter four "the bill of Rights" affirms the right of all Kenyan to education. The constitution made free primary education a right for every Kenyan hence making it illegal for any parent who chooses not to send their children to school. The Ministry of Higher Education Science and Technology adapted the affirmative action which aims at offering more opportunities for women in higher learning institutions during admission. Vision 2030 on education and training overall goal for 2012 was to reduce illiteracy by increasing access to education and improving transition rates from primary to secondary school. Other goals include achieving 80% adult literacy, increasing the school enrolment rate to 95% and increasing transition rates from 3% to 8% by 2012. The 2030 goal on equity aims to expand access across different social and political dimension including increasing school's enrolment for girls and children from nomadic counties and poor rural and slum communities.

There has been a strong global move towards gender parity in education, particularly at the primary and secondary level. However, despite remarkable achievement in many countries over the past years girls remain excluded from education. According to Education Response (2011) worldwide 64% of the illiterate are females. World Bank (2008) indicates that girls are more disadvantaged and it is very common in Africa and parts of Asia. Equity in terms of gender parity index is an issue and it's often more prominent in secondary, technical and vocational than in primary (UNESCO 2011). Studies by UNESCO (2011) indicate that globally about 19 million girls of lower secondary age are currently not enrolled in either primary or secondary institutions. Women in Kenya form majority of the uneducated population (Society for International Development 2010). The introduction of free primary education in 2003 and free day secondary education did not mean that every child is in school. A

majority of the 1.9 million children aged 9-13 years old are still out of school and are found in informal settlements, disadvantaged homes and rural parts of the country mostly occupied by pastoralist and still most of children are girls (Ministry of Devolution 2013). Narok County is a dominant pastoral area and women literacy is at 31 percent compared to men at 69 percent (Narok County profile 2013).

Many countries despite great efforts have made little progress as girls continue to face deep discrimination in access to schooling. The goal to achieve gender parity by 2005 was missed by 122 countries. EFA global report 2004 found out that 40% of 128 countries from which data is available are likely to miss reaching gender parity in primary and secondary by 2015. In these countries policies are available that can deliver parity but several factors hinder implementation. The government of Kenya through the ministry of gender has put in measures to address gender issues. Special programmes have been initiated to facilitate girls accessing education and ensure equity. These efforts have not yielded much to increase girls access to education as combination of factors continue to deny girls right to education especially in Counties found in Arid and Semi-Arid Lands (ASAL). The minister for education as he announced Kenya Certificate of Primary Education results in 2014 noted that counties in ASAL recorded gender disparities with the ratio number of girls who sat for the exam being fewer than boys, Narok County being one of them. Most people in the County uphold their culture and are not readily giving into current changes despite efforts being undertaken by various groups.

Achieving gender parity is a problem worldwide, therefore there is a crisis that needs to be addressed by finding out factors hindering enforcement of gender policies in education, those hindering girls from accessing education and those forcing girls out of school. The study aimed at coming up with intervention strategies of improving girls participation in education especially in marginalized areas in Kenya. This study would be of benefit to policy makers and implementers in Narok and Kenya at large.

THEORETICAL FRAMEWORK

The study was based on William Ogburn's (1964) "Cultural Lag Theory". Ogburn argues that within a society as a whole change takes place in material and non-adaptive culture (beliefs and institutional practices). According to Ogburn lag occurs when one or two parts of culture which are correlated change in a greater degree than the other. The theory of cultural lag suggests that a period of maladjustment occurs when non-material culture is struggling to adapt to new material conditions. Ogburn states that independent variables causing the lag could be ideological, economic, political or social. The Maasai girls find themselves in midst of contrasting forces of two elements of non-material culture (Education and cultural practices). They ought to undergo formal schooling whereby they have to be educated according to modern school system (non-material culture) and at the same time they are culturally compelled to be socialized into societal norms and values. Through the socialization process, the social set up socialized the child into non-material culture and transmitted her to accumulating experience of her people and also socialized her to fit into membership of the group (another non-material culture). This is like parallel education.

The girl child in Narok are a product of a society that resist change thus causing maladjustments. They are caught up between two opposing forces, on one hand the culture of her people which if she does not follow will result into rejection and make her an outcast therefore a social misfit. On the other hand the Maasai girl child is also at a crucial age where she is supposed to attend the formal education like all other children of her age to prepare her fit in with modern society and face future challenges. In most cases the Maasai girl chooses to identify with their long standing traditional culture which is resistant to change hence not able to continue with the fast evolving formal education. According to Ogburn (1957) one of the most important keys to understanding society is to be able to understand the motivation of both individual and groups. In cultural lag choice on both individual level as well as in a group is motivated by many conflicting factors that influence how individual perceive a given situation. Some causes for change and adjustment are ideological while others are political, cultural or based

on religious beliefs. The Maasai girl child is surrounded by several external and internal forces beyond her control, hence lag of non-material culture.

METHODOLOGY

The focus of the study was restricted to implementation and enforcement of gender policies in Education in Narok County, Kenya. Women literacy in Narok County is at 31 percent compared to men at 69 percent (Narok County Profile 2013). The study population comprised of 864 teachers and 111925 female students in public primary schools, 351 government officers, 546 Village elders and 169220 households. Samples were drawn using purposive, simple random sampling, stratified sampling and systematic sampling. A sample of 998 respondent was utilized as the sample size.

In this study, ex-post facto and descriptive survey design were adopted to establish the extent to which Gender Based Violence influencers the enforcement of Gender Policies in Education in Narok County, Kenya. Data was collected by use of questionnaire, interview schedules and focus group discussions. Secondary data was obtained from literature review, which comprised of documentary sources on similar studies and policy documents from national and international sources. Questionnaire were administered to students. Interviews were conducted to all government officers while women and village elders were put in focus groups. Data collected was analyzed quantitatively by use of descriptive statistics and qualitatively transcribed and discussed based on established themes. The data collected a wide range of views, opinions, attitudes and values, from which similarities were extracted and comparisons made.

RESULTS AND DISCUSSIONS

Social Demographic Information

The respondent had varied age groups who gave their opinion on the subject under study. Most of the teachers and top Government Officers had a bachelor’s degree and a few had a master’s degree. The majority of the chiefs and Assistant Chiefs had primary and secondary education thus they had very little knowledge of the laws and policies that protect girls. On length of service majority of the teachers and government Officers had served in the county for over 5 years an indication that they had good knowledge of the Maasai culture .The findings revealed that majority of the learners lived with both parents, this is an indication that family values are very strong in the community. Quite a number of girls were from rescue centers an indication of government efforts and NGOs to rescue girls from harmful cultural practices. On parents’ level of education majority of the mothers had never been to school, quite a number had primary education and a few had secondary education. Majority of the parents were livestock farmers due to the pastoral nature of the Maasai community.

Findings on Extent to which Gender Based Violence influences enforcement of gender polices in education

Table 1: Access and drop out

Statement		Yes	NO
Do you know of girls who have never been to school		68.48%	31.52
Do you have siblings who have never been to school	Brother	12.40%	87.60%
	Sister	23%	77%
Do you have classmates who dropped out of school	Boy	28.17	71.83
	Girl	85.56%	13.44%
Do you have siblings who have dropped out of school	Brother	22.22%	77.78%
	Sister	38.76%	61.24%

On access the study found out that 68.48% of the girls agreed that there are girls who had never been to school while 31.52 disagreed. 52.63% of the teacher agreed on the statement while 47.37% disagreed. Findings from the girls indicated that 12.40%

had brothers who had never been to school while 71.83% did not have brothers who had never been to school. 23% had sisters who had never been to school while 77% did not have. Interview with government officers also indicated that quite a number of children were out of school with the female gender more affected than the male gender.

On drop out the girls results showed that 28.17% had male classmates who had dropped out of school while 71.83% did not have and 85.56% had female classmates who had dropped out of school while 13.41 did not have. Results from the girls also indicated that 22.22% had brothers who had dropped out of school while 77.78% did not have and 38.78% had sisters who had dropped out of school while 61.24% did not have. Findings from the teachers indicated that 82.11% of the teachers agreed that there were cases of drop outs in the schools. All the teachers were in agreement with the statement that more girls than boys dropped out of school. Interview with government officers indicated that dropping out of school by learners before completing the indent course was a problem in Narok County with more girls than boys drop out of school.

Table 2: Levels at which girls dropped out of school

Statement	Respondent	F/%	Lower primary	Upper Primary	F1-F2	F3-F4
At what level do girls mostly drop out of school	Girls	%	5.43%	50.90%	32.04%	11.63%
	Teacher		-	-	76.84%	23.16%

The results from girls indicate that 5.43% dropped in lower primary, 51.90% in upper primary, 32.04% dropped in form one and two while 11.63% dropped in form three and four. Finding from the teachers indicated that 76.84% of the dropouts occurred in form one and two while 23.16% dropped in form three and four. The results therefore imply that there have been cases of drop out thus interfering with the enforcement of the policy of retention and completion. According to results from girls' responses most of the girls dropped out of school in upper primary and a large number of girls don't join secondary school. The age at which girls are supposed to join secondary is the same age at which they are circumcised and stay home in preparation for marriage. Quite a number of those who join drop at one level.

Table 3: Gender disparities in enforcing Gender Policies in Education (girls' responses)

Statement	F/%	SA	A	UD	D	SD
		%	%	%	%	%
More boys than girls access education		56.33	11.37	1.03	6.46	24.81
Most of my classmate were able to join secondary school	Female	12.40	6.22	1.03	14.42	65.56
	Male	41.35	3.36	4.91	1.03	49.35
Free day secondary education has increased girls' access to secondary education		21.45	6.20	0.52	17.31	54.52
The government has provided girls with sanitary towels		24.81	5.17	1.03	14.99	54.00
Parents prioritize boy child education compared to girls education		27.65	22,74	0.25	16.80	32.56

The finding of the study established that 56.33% of the girls strongly agreed that more boys than girls' access education the girls while 24.81% strongly disagreed. Further 65.56% strongly disagreed that all of their female classmates were able to join secondary school while 12.40% strongly agreed. 49.35% strongly disagreed that all their male classmates were able to access secondary education while 41.35% strongly agreed with the statement. 54.52% of the girls strongly disagreed that free day secondary has increased girls' access to secondary education while 21.45% strongly agreed. 54.00% of the girls strongly disagreed that the government has provided girls with sanitary towels while 24.81% strongly agreed. Quite a number of girls, 32.56% strongly disagreed that parents give priority to boy child education compared to girl child while 27.65% strongly agreed.

From the study findings there are disparities in access and transition from primary to secondary with more girls affected than boys.

Table 4: Gender disparities in enforcing Gender Policies in Education

	Response	F %	Women	Teachers	Government officers	Village Elders
a) Access	Female	F	380	90	62	52
When it comes to taking children to school which Gender is disadvantaged		%	95.24%	94.74%	100%	94.5%
	Male	F	19	5	0	3
		%	4.76%	5.26%	0.0%	5.5%
b) Retention	Female	F	14	10	1	0
Which Gender is most likely to remain in school until completion		%	3.51%	10.53%	1.61%	0.0%
	Male	F	385	85	61	55
		%	96.49%	89.47%	98.39%	100%
c) Transition	Female	F	0	12	1	7
Which gender has the highest transition to institution of higher learning		%	0.0%	12.63%	1.61%	12.7%
	Male	F	399	83	61	48
		%	100%	87.37%	98.39%	87.3%
d) Free Primary Education(FEP)	Yes	F	156	54	38	27
Free primary education increased girls access to education.		%	39.10%	56.84%	61.29%	49.1%
	No	F	243	41	24	28
		%	60.90%	43.16%	38.71%	50.9%
e) Free Day Secondary Education	Yes	F	95	36	21	19
Free day secondary education increased girls access to secondary education		%	23.81%	37.89%	33.87%	34.5%
	No	F	304	59	41	36
		%	76.19%	62.10%	66.13%	65.5%

Group discussion with women indicated that 95.24% of the women involved in the study agreed that the female gender is disadvantaged when it comes to taking children to school while 94.5% of the village elders also agreed with the same. 94.74% of the teachers agreed that the female gender is disadvantaged when it comes to taking children to school while interview with government showed that all of them agreed with the statement due to a number of reasons like the community does not value girl child education. The same was also indicated by teachers in their questionnaire. 96.49% of the women involved in study stated that more boys than girls are likely to complete school at any given level while all the elders agreed on the same. This was also supported by teachers (89.47%) who indicated that more boys than girls are likely to complete education as girls are affected by early pregnancies and early marriages. Results from interviewing the government officers showed that the male gender is most likely to complete education at any given level compared to the female gender due to a number of factors such as early marriage and priority given to boy child education.

Group discussion with women showed that more boys than girls join secondary schools and colleges because most girls drop out of school after class eight a time at which majority undergo FGM in preparation for marriage. Group discussion with the village elders showed that 87.3% of the elders agreed on the same. 67.37% of the teachers agreed that more males than females' transit to secondary and other institutions of higher learning. Interview with government officer showed that majority agreed that the male gender has the highest transition to secondary school and other institutions of higher learning due to restriction put on girls.

Further findings from the study showed that 60.90% of the women disagreed that free primary education has increased girls access to education due to factors such as FGM and early marriage and girls drop out of school before completing primary level. The village elders 50.90% disagreed that free primary education has increased girls access to education. They further added that education is not free as there are many levies being charged in schools. 56.84% of the teachers agreed that free primary education has increased girls access to education but not to the expected level as girl child education is affected by many challenges. Majority of the government officers agreed that free primary education has increased girls access to education although implementation of the policy is being affected by factors within the family and the community.

On free day secondary education most of the women in the study disagreed that it has increased girls access to secondary education as many girls drop out before or after completing primary level. 65.5% Of the elders disagreed with the statement. Most of the teachers 76.19% disagreed that free day secondary education has increased girls access. Interview with government officers showed that 66.15% disagreed that free day secondary education has increased girls access to education as the girl child in Narok faces so many challenges that forces her out of school such as preference of educating boy child as security for old age and poverty.

Table 5: Factors influencing enforcement of Gender Policies in Education

Statement		SA	D	UD	D	SD
FGM is a reason for many girls dropping out of school	Girls	239	57	6	25	60
		61.76%	14.73%	1.55%	6.46%	15.50%
	Teachers	42	30	7	12	4
		44.21	31.58%	7.37%	12.63%	4.21%
Early marriage forces girls out of school	Girls	291	26	2	13	55
		75.19%	6.72%	0.52%	3.36%	14.21%
	Teachers	58	31	2	0	4
		61.05%	32.63%	2.11%	0.0%	4.21%
Domestic workload reduces girls' opportunity to attend school	Girls	228	41	6	27	85
		58.91%	10.59%	1.55%	6.98%	21.97%
	Teacher	39	26	8	10	12
		41.05%	27.37%	8.42%	10.53%	12.63%
Customs and beliefs affect girls schooling	Girls	198	51	12	29	97
		51.16%	13.19%	3.10%	7.49%	25.06%
	Teachers	50	7	0	5	33
		52.63%	7.36%	0.0%	5.27%	34.74%
Insecurity affects girls schooling	Girls	54	55	11	76	191
		13.95%	14.21%	2.84%	19.64%	49.36%
	Teacher	45	6	5	15	24
		47.37%	6.32%	5.26%	15.79%	25.26%
Long distant to school affects girls schooling	Girls	78	71	7	73	158
		20.16%	18.35%	1.81%	18.86%	40.82%
	Teachers	32	9	12	0	42
		33.68%	9.48%	12.63%	0.0%	44.21%

The finding indicated that 61.76% of the girls strongly agreed that FGM is a reason for many girls dropping out of school while 15.50% of the girls strongly disagreed with the statement. Results from the teachers indicated that 44.21% of the teachers strongly agreed that FGM is a reason for many girls dropping out of school while 4.21% strongly disagreed with the statement. Group discussion with women indicated that girls are forced out of school after undergoing FGM as it is a rite that transformed young girls into women in preparation for marriage. The village elders agreed that girls drop out of school after FGM girls in readiness for marriage. Interview with government officers indicated that most girls get circumcised at tender age when they are in primary, in most cases before reaching class six and then drop out. They added that very few even complete the primary

circle, thus hindering achieving 100% completion through the free primary education and transition of girls to secondary schools.

The study also sought to find out if early marriage forces girls out of school and the results showed that 75.19% of the girls strongly agreed that early marriage forces girls out of school while 14.21% strongly disagreed with the statement. All the women involved in the study agreed that early marriage forces girls out of school because after FGM the girls have bride grooms ready to marry them thus bringing an end to their education. This was further supported by the village elders who stated that girls only attend school until they are ready for FGM that prepares them for marriage. They further added that education of girls after primary school will make them lose their moral values and also educating girls is a waste of resources as they will eventually benefit another family. 61.05% of the teachers strongly agreed that early marriage forces girls out of school while 4.21% strongly disagreed. Interview with government officers indicated that enrolment of girls decrease in upper classes and quite a large number does not join secondary school. Early marriage was the main factor forcing girls out of school and the marriage arrangement are done so secretly that even the law enforcers are unable to realize it and save the girls.

The study also sought to find out whether domestic workload reduces girls' opportunity to attend school. The result indicated that 58.91% of the girls strongly agreed that domestic workload affects girls schooling while 21.97% strongly disagreed. Most of the women agreed that domestic workload reduces girls' opportunity to attend school as they have to help with household chores before and after school. The village elders strongly disagreed that domestic workload reduces girls' opportunity to attend school because it's part of their education as they prepare to take their adult responsibilities of taking care of the family. 41.05% of the teachers strongly agreed that domestic workload reduces girls' opportunity to attend school while 12.63% strongly disagreed. Interview with government officers indicated that domestic workload reduces girls' opportunity to attend school because the chores given to girls before and after school affect their ability to complete their assignments and they are always late for school. Some of the girls miss school occasionally as they babysit at home. The chores affect their studies and eventually drop out.

Further findings indicated that 51.56% of the girls strongly agreed that customs and beliefs reduce girls' opportunity to attend school. The women involved in the study stated that the custom and beliefs discriminate women and girls. The community believes that educating girls is a waste of resources. The village elder did not agree that customs and beliefs reduces girls opportunity to attend schooling but stated that educated girls are likely to become prostitutes and are likely to look down on their husbands. The village elders also added that the community prefer educating boys as security for old age. Results from the teachers indicated that 52.63% of the teachers strongly agreed that customs and beliefs reduces girls' opportunity to attend school while 34.74% strongly disagreed with the statement. The government officers stated that the beliefs about education of girls is discriminative as parents prefer educating boys. They also added that girls are married off and the bride price used to educate their brothers.

The study also showed that 49.36% of the girls strongly disagreed that insecurity affects girls schooling while 13.95% of the girls strongly agreed with the statement. The women involved were not very sure whether insecurity affects girls schooling. Results from group discussion with village elders indicated that there is no insecurity in the county so they disagreed with the statement. Results from the teachers indicated that 47.37% of the teachers strongly agreed that insecurity affects girls schooling while 25.20% strongly disagreed with the statement. The government officers stated that insecurity affects schooling of girls due to the nature of routes the girls follow to school and there were cases of defilement reported.

The study findings indicated that 40.82% of the girls strongly disagreed that long distant to school affects girls schooling while 20.16% strongly agreed with the statement. Group discussion with women were in agreement that long distant to school affects

girls schooling as schools are far from homes. The village elders also agreed that distant to school affects girls schooling but just to a small extent. 44.21% of the teachers strongly disagreed that distant to school affects girls schooling while 33.68% strongly agreed that distant to school affects girls schooling. This was confirmed by results obtained from interviewing the government officers who were for the opinion that distance did not affect girls schooling but rather the pastoral nature of the community.

The study sought the opinion of the teachers and government officers on other factors that affect girls schooling. The teachers gave early pregnancies, poverty and illiteracy among parents as the main factors forcing girls out of school. Other factors given by teachers were, culture and lack basic necessities required to keep girls in school. The main factors mentioned by government officers was culture that does not value girl child education, poverty and early pregnancies. Other factors mentioned by government officers were, large families that makes it impossible for parents to provide girls with basic necessities thus forcing them to drop out of school, extra levies and illiteracy among parents. The government officers indicated that Narok County is one among the counties that has reported many cases of early pregnancies and this may be due to the education given to girls prior to FGM as a rite that transformed girls into women and after the cut they can take adult responsibilities.

Table 6: Relationship between GBV and Enforcement of Gender Policies in Education

Correlations		Gender	Gender disparities in enforcement on Gender policies in education	Influence of GBV on enforcement of gender policies in Education
Gender	Pearson Correlation	1	-.105*	-.174**
	Sig. (2-tailed)		.039	.001
	N	387	387	387
Gender disparities in enforcement on Gender policies in education	Pearson Correlation	-.105*	1	.466**
	Sig. (2-tailed)	.039		.000
	N	387	387	387
Influence of GBV on enforcement of gender policies in Education	Pearson Correlation	-.174**	.466**	1
	Sig. (2-tailed)	.001	.000	
	N	387	387	387

*. Correlation is significant at the 0.05 level (2-tailed).

The study found a statistically significance positive and high correlation coefficient between GBV and enforcement of gender policies in education ($r = 0.174$, p - value = 0.001). GBV and enforcement of Gender policies in education in Narok County are correlated. This evidence that GBV hinders enforcement of Gender Policies in Education. Were by girls are withdrawn from school after undergoing FGM which is gives the girls signal that they are ready for marriage and adult responsibilities.

CONCLUSION AND RECOMENDATIONS

The study established that there were cases of girls who had never been to school and more girls dropped out of school than boys. Girls were disadvantaged in terms of access, retention, completion and transition to institution of higher learning. The study concludes that the main factors hindering enforcement of Gender Policies in Education were early pregnancies, poverty and early marriages. Other factors were illiteracy among parents, domestic chores, culture that discriminates the female gender and large families that makes it difficult for parents to provide girls with basic necessities. No value was attached to girl child education and parent gave priority to boys than to girl child education. Girls had more domestic chores at home before and after school which made them abandon education and went for marriage. Illiteracy among parents made it difficult for them to

understand the value of girl child education. Due to high illiteracy rate among parents it was evident that the same trade will continue in the next generation. The uneducated girls and women are likely to be exploited and brainwashed by traditional education and most likely become vulnerable to violence and poverty as well as their children. The uneducated girls have also been socialized to believe formal education is secondary to their culture and traditional education.

The study recommends that parents should be sensitized to change their attitude and embrace girl child education. Cultural practices that discriminate and forces girls out of school should be dealt with. To increase girls' access to education girls to be provided with basic necessities and education to be made flexible to allow girls deal with domestic chores and attend school. The study also recommends involvement of all stakeholders to ensure access, retention, completion and transition. Use of chiefs and assistant chiefs to follow up on drop outs and also work on door to door campaigns. The study also recommends increase in human and financial resources to ensure close monitoring. Girl child education in ASAL to be made free at all levels and government to give extra support to schools providing boarding facilities to ensure girls receive all the basic necessities in their learning. More boarding schools to be built so that girls could be away from home and also free from pressure of house chores. Girls who have dropped out of school and those affected by early marriage and early pregnancies to be readmitted back to school and school work to be reduced to enable them deal with school work and domestic work load. The education policy must have the interest of girls who had never been to school and who dropped out of school before acquiring necessary skills and knowledge.

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The extent to which Gender Based Violence influences the enforcement of Gender Policies on Women Empowerment in Narok County, Kenya

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Abstract

Gender targeted policies are increasingly becoming part of everyday program before and during the Sustainable Development Goals (SDGs) period unto 2030. Many programs have been introduced to ensure enforcement of gender policies on women empowerment but despite government efforts to address the issues, women disempowerment is still endemic in Kenya especially in counties located in Arid and semi- Arid Lands (ASAL). The study was guided by cultural lag theory by William Ogburn. The purpose of the study was to establish the extent to which Gender Based Violence (GBV) influences the enforcement of Gender Policies on Women Empowerment in Narok County, Kenya. The study adopted the ex-post-facto survey and descriptive survey design. Samples were drawn using stratified, simple random, purposive and systematic sampling. Questionnaires, interview schedule and focus group discussions were used to collect data. Quantitative data were analyzed through descriptive statistics such as frequency percentages and correlation statistics. Qualitative data were transcribed and discussed based on established themes. The study found out that the policies made to empower women are there but they have not been enforced to empower women and remove them from poverty and traditional exclusion. GBV most of it cultural affected the enforcement of Gender Policies on Women Empowerment. Cultural factors influencing enforcement of gender policies on women empowerment were FGM, early marriage, culture, powerful traditional institutions, patriarchal society and male chauvinism. Other factors were restriction put on women, dependency on husbands and societal roles. The study recommends need to challenge believes that girls and women are of less social, economic and political value than men and full implementation of gender policies on women empowerment. The government should also provide a public space for women to challenge unjust behaviors and enhance policies that will assist women ascent into power. These findings are significant not only to policy implementers and government but also to the entire society to understand the place of women in the society. The study provides a baseline to policy makers and enforcers to put in place laws and enforce policies that protect women from abuse and humiliation.

Index Terms: Gender, Gender Based Violence, Gender Policies, Women Empowerment, Enforcement.

INTRODUCTION

Gender based violence most of it cultural is a human right issue affecting girls and women. According to UN (1998) violence against women should be understood within the context of women and girls subordination status to men

and boys in the society. Many cultures have beliefs, norms and social institutions that legitimizes women subordination, therefore perpetuating violence against women (Heise et al, 1990). According to Coalition on Violence against Women (COVAW 2017), violence against women has been acknowledged as a violation of basic human rights and a form discrimination against women, reflecting the prevalent imbalance of power between women and men.

Gender targeted issues especially those affecting women and girls are increasingly becoming a part of everyday programme. Global initiative include global convention and conferences by United Nations, continental convention for example African Union convention and national policies at countries levels. In the UN the commitment to gender equity and women empowerment can be traced to 1948 United Nation Charter and Universal Declaration of Human Rights which states that rights and freedoms will not be limited by a person's gender and established that, "All human beings are born free and equal in dignity and rights". Since then milestones include, the 1975 Mexico city 1st women conference, the 1975 adaption of CEDAW, the 1980 Copenhagen 2nd women conference, the 1995 Beijing Platform for Action, the 2000 Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs 2015)

In 1946 the United Nations created the division of advancement of women (DAW) to champion women empowerment and gender equality in order to ensure women, being half of the world's population enjoy equal rights as well as living in dignity as equal citizens everywhere. The 1st world conference on the status of women by UN in Mexico City addressed key areas of gender equality, discrimination, integration and full participation of women in development. The 1980 Copenhagen 2nd women conference called for national measures to ensure women ownership and control of property as well as improvement of women, rights to inheritance and equal access to education and employment opportunities. The UN 3rd conference on women in Nairobi (1985) urged member states to take constitutional and legal steps to eliminate all forms of discrimination against women. It recommended for greater empowerment in regards to health, education and employment, equal participation and equitable representation at all levels of political process and public life. Beijing Platform for Action (1995) highlighted the necessity to ensure that gender equality is a primary goal in all social and economic development. MDG number 3 on gender equality and empowerment of women become an effective way to bridge gender gaps in all areas. Among the 17 Sustainable Development Goals (SDGs 2015) goal 5 aims to achieve gender equality and empower all women and girls. The incorporation of this goal in the SDGs is a clear indication that some countries in the world were unable to achieve it during the time of MDGs.

African Union (AU) states are signatories of the UN General Assembly Land Mark Convention for the Elimination of All Forms of Discrimination against Women (CEDAW) which was adopted in 1979. The AU commitment to gender equality and advancement of women is rooted in African Charter on Human and Peoples Rights. The commitment is reinforced by Protocol to African Charter on Human and Peoples Rights on the Rights of Women in Africa (Maputo Protocol (2003), Solemn Declaration on Gender Equality in Africa 2004 and AU Gender Policy 2015. The AU gender policy focuses on closing the equality gap between men and women and particularly addressing gender inequalities which have resulted into women disempowerment and feminization of poverty. The policy offer opportunities for

empowerment of women, guarantee protection against violence as well as ensure their participation in public and economic life.

Kenya is a signatory to many international and regional treaties in support of gender equality and women empowerment. The country has put in place various policies, plan and programs aimed at addressing gender gaps and empower women which include the Kenya National Gender Policy, Affirmative Action, the 2010 constitution, presidential directives and legislations and most recently vision 2030. The policies are in consistence with the government commitment to implement the National Plan of Action based on the Beijing Platform for Africa. The national gender policy is supposed to provide a framework for advancement of women and approach that would lead to greater efficiency in resource allocation and utilization to ensure empowerment of women. The guiding principles of the policy include women rights, gender fairness and justice, equity in treatment of women as well as equal opportunities to access national resources and promote economic empowerment of women.

The Affirmative Action targets women development as a creative measure to equalize opportunities and access to relevant training to be provided to improve knowledge, skills and attitudes toward gender equality. In public service the affirmative action was made to ensure adequate women participation in the civil service and increase proportion of women in civil service senior management. The 2007 Political Party Act provided for 50 percent chance women representation in party nomination. The 2010 constitution sought to cure the old age problem of marginalization of women by ensuring women share equal opportunities and including women in decision making and the government.

The 2030 goal on equality aims to attaining gender parity and fairness in delivering justice and reducing social inequalities. The vision 2030 for gender, youth and vulnerable groups is on equity in power and resources distribution between sexes, improvement of livelihood for all vulnerable groups. Specific strategies involve increasing the participation of women in all economic, social and political decision making process, starting with high representation of women in parliament, improving access to business opportunities, health and education and minimizing vulnerabilities through prohibition of retrogressive practices such as FGM, early marriage and child labour.

Though the laws and policies have been in place for decades women are not fully enjoying the human dignity and opportunities they fully deserve. Extensive discrimination against women continue to exist all over the world. According to OECD (2016) Development center despite several laws that demand gender equity in matters of ownership and inheritance, women are often discriminate against. Although the government of Kenya has shown a lot of efforts to ensure equality and women empowerment, gender imbalance remain a major problem in all areas of the economy. In the political arena very few women are elected. Kenya is particularly weak compared to other countries in the area in terms of political empowerment of women, for instance Rwanda which serves as an ideal example in regard to equity in representation (Africa Development Form VI, 2008).

Kenya in terms of Gender Inequality has an overall GII of 0.651(Draft 7th Human Development Report). This is however, not equal everywhere as there are regional disparities with counties located in Arid and Semi- Arid Lands (ASALs) having high Gender Inequality Indices. Narok County is found in ASAL and the Maasai community living in the

county are not readily giving in to current changes in the world despite all efforts being undertaken by various groups. The female gender in Narok County are a product of a society that over time since independence in 1963, education and empowerment of women have taken a slow pace. Achievement of MDG number three is weak in Narok which is a dominant pastoral area where leadership amongst women is low. The county reflects gender-based disadvantages in three dimensions - reproductive health, women empowerment and the labour market. MDG number three has also lagged behind with women literacy at 31 percent compared to men at 69 percent (Narok County Profile 2013).

Documentary source on similar studies and policy documents from national and international sources demonstrate that, even if the laws and policies are there they remain a vaguely worded statement as they have not been implemented to protect and empower women especially in rural areas where majority of the affected women live. Many challenges reign hampering a coordinated effort to enforce laws that protect women and gender policies on women empowerment.

THEORITICAL PERSPECTIVE

The cultural lag theory by William F. Ogburn (1964) was the underlying theoretical perspective of the study, focusing on the fact that all parts of culture do not change at the same pace. According to Ogburn cultural lag occurs when one or two parts of culture that are correlated change before or in a greater degree than the other parts. When change occur in material culture of the society non-material culture must adapt to that change. William Ogburn argues that within a society as a whole change takes place in the material and the adaptive non-material culture (belief systems and institutional practices)

Cultural lag refers to the notion that culture takes time to catch up with technological innovations. Different rates of change in material and non-material culture accounts for this lag and social problems and conflicts are caused by this lag. In this sense Ogburn (1957) conceptualized cultural lag as a failure of ideas, attitudes and aspects of institutional practices to keep pace with changes in adaptive culture.

The theory of cultural lag states that a period of maladjustment occur when the non-material culture is struggling to adopt to new material conditions. The Maasai woman is caught in between two opposing forces and in most cases choosing to identify with her long standing traditional culture which resist change hence not able to advance socially, economically and politically. The Maasai woman ends up academically and professionally handicapped thus unable to compete favorably with males.

METHODOLOGY

The focus of the study was restricted to implementation and enforcement of gender policies on women empowerment in Narok County. Narok County is found in ASAL and most women in ASAL are affected by outdated traditions that restrict their advancement (Limangura 2000). Further to this counties in ASAL have high Gender Inequalities (Ministry of Devolution and planning 2013).The study population comprised of 864 teachers and 111925 female students in public primary schools, 351 government officers, 546 Village elders and 169220 households. Samples were drawn using purposive, simple random sampling, stratified sampling and systematic sampling. In this

study, ex-post facto and descriptive survey design were adopted to establish the extent to which Gender Based Violence influencers the enforcement of Gender Policies on women empowerment in Narok County.

Data was collected by use of questionnaire, interview schedules and focus group discussions. Secondary data was obtained from literature review, which comprised of documentary sources on similar studies and policy documents from national and international sources. Questionnaire were administered to students, Principals and teachers. Interviews were conducted to all government officers and women and village elders were put in focus groups Data collected was analyzed quantitatively by use of descriptive statistics and qualitatively transcribed and discussed based on established themes. Data collected brought a wide range of views, opinions, attitude and values from which similarities were extracted and comparisons made

RESULTS AND DISCUSSIONS

Social Demographic Information

Data from Narok County education office in 2016 indicate that the county has 537 male teachers, 234 female teachers and among the 33 curriculum support officers only 9 were female. Most of the administrators were males with a few women in lower administrative post. This is a clear indication that government offices are dominated by males. The respondent had varied age and most of the teachers and top Government Officers had a bachelor’s degree and a few had a master’s degree. Majority of the chiefs and Assistant Chiefs had primary and secondary education thus they had very little knowledge of the laws and policies that protect and empower women. Majority of the teachers and government Officers had served in the county for over 5 years so they had good knowledge of the Maasai culture. Majority of the mothers had never been to school, quite a number had primary education and a few had secondary education. Majority of the parents were livestock farmers due to the pastoral nature of the Maasai community.

Findings on Gender Based Violence and enforcement of Gender Policies on Women Empowerment

Table 1: Government efforts to enforce gender policies on women empowerment

Statement	SA	A	UD	D	SD
Kenya National Gender Policy					
Women are able to access finances for advancement There is fairness and justice in the treatment of women	15.79 21.05%	1.05% 2.11	8.42% 0.0%	11.58% 6.32%	63.16% 70.53%
Affirmative Action					
40%-50% of public service are women	13.68%	7.38%	1.05%	4.21%	73.68%
Political Party Act 2007					
50% of political parties nomination are women	9.47%	2.11%	0.0	0.0%	88.42%
The 2010 Constitution					
The constitution has helped to improve the traditional exclusion of women	5.26%	0.0%	3.16	1.05%	90.53%
Vision 2030					
Alleviation of poverty in ASAL has been achieved	20%	1.05%	0.0%	4.21%	74.74%
Women have access to business opportunities	41.05%	9.47%	0.0%	3.16%	46.32%
Women have benefited from Women Enterprise Fund	37.89%	6.32%	5.26%	3.16%	47.37%
Women have benefited from Social Protection Fund	18.94%	0.0%	0.0%	8.42%	72.64%
Young women have benefited from the Youth Fund	24.21%	3.16%	2.11%	4.21%	66.32%

Focus group discussion with women revealed that women had not benefited from the Kenya National Gender Policy which enables women to access finances for advancement and ensures fairness and justice in the treatment of women. They further added that women are always treated inferior to men, are discriminated in all areas and had difficulties in accessing financial resources as men carry their identity cards and everything they do should be in consultation with their husbands. Focus group discussion with the elders indicated that women are provided for by their husbands and there is no need for them to seek financial support from institutions. On fairness and justice on treatment of women the village elders did neither agree nor disagree with the statement but stated culture of the community gives the male gender supremacy over the female.

On the affirmative action that allows women to access top leadership position and get 40%-50% of public service position, the women involved in the study stated that it is impossible for women to rise to top leadership position as leadership in the community belongs only to the male gender and they are in a better position to get jobs in government offices. Women lack education and skills and are looked down on. The village elders stated that women are like children and cannot make good leaders as they can easily be deceived.

The study also sought the opinion of teachers on enforcement of Gender Policies on women empowerment. On the Kenya National Gender Policy, 63.16% of the teachers strongly disagreed that women have access to finances for advancement and 70.53% strongly disagreed that there is fairness and justice in the treatment of women. On the Affirmative Action 73.68% of the teachers strongly disagreed that 40%-50% of public servants are women. On the Political Party Act (2007) 88.42% of the teachers strongly disagreed that 50% of the political party nomination are women while 90.53% strongly disagreed that the 2010 Constitution had helped to improve the traditional exclusion of women. On Gender policies in Vision 2030, most of the teachers (74.74%) strongly disagreed that alleviation of poverty has been achieved in ASAL and 46.32% strongly disagreed that women have access to business opportunities while 41.05% strongly agreed on the same. The study also sought the opinion of the teachers on whether women in the community had benefited from the funds in Vision 2030 made to empower them. The results showed that 47.37% strongly disagreed that women in the community had benefited from Women Enterprise Fund while 37.89% strongly agreed on the same. Findings indicated that 72.64% strongly disagreed that women in the community had benefited from the Social Protection Fund, while 66.32% strongly disagreed that young women had benefited from the Youth Fund.

The study sought the opinion of government officers on whether women had benefited from the Kenya National Gender Policy that allows women access finances. All the government officers strongly disagreed that women are able to access finances for advancement because they are dependent on men. They also added that it was difficult in such a patriarchal community for women to obtain fairness and justice. On the Affirmative Action the opinion of government officers clearly stated that it was very difficult to implement it due to the patriarchal nature of the community where leadership among women is almost a taboo and also due to high level of illiteracy among women.

On the political party Act, the government officer stated that party leaders had knowledge on the Act but no party was willing to nominate women as no one would vote for them. The government officers strongly disagreed that the 2010 constitution had helped to improve the traditional exclusion of women. They also added that the government has been unable to ensure equal participation of men and women in government and so far the one third gender rule has not been implemented. On Vision 2030 the government officers disagreed that the funds have been used to alleviate poverty in ASAL as a large population was still living in poverty. The government officers stated a few women had benefited from the Women Enterprise fund and none had benefited from the Youth Fund and the Social Protection Fund. For those who have been able to access the funds they have not been able to improve their life because no education was given on how to use the funds to improve their lives.

Table 2: Factors hindering women from being Empowered Socially, economically and politically

Statement		SA	D	UD	D	SD
FGM denies girls and women education necessary for economic and political empowerment	Girls	206 53.23%	30 17.57%	1 0.26%	46 11.89%	66 17.05%
	Teachers	27 28.42%	29 30.53%	14 14.74%	10 10.53%	15 15.79%
Early marriage prevents girls and women from acquiring education, training and development skills	Girls	262 67.70%	29 7.49%	9 2.33%	5 1.29%	82 21.19%
	Teacher	59 62.11%	21 22.11%	10 10.53%	3 3.16%	2 2.11%
Traditional institution elevate men over women	Girls	269 69.51%	69 17.83%	3 0.78%	23 5.94%	23 5.94%
	Teachers	54 56.84%	33 34.74%	5 5.26%	3 3.16%	0 0.0
Custom and beliefs legitimizes women subordination	Girls	231 59.69%	92 23.77%	6 1.55%	25 6.46%	33 8.53%
	Teachers	46 48.42%	36 37.90%	5 5.26%	3 3.16%	5 5.26%
Culture of the community does not allow women to participate in decision making	Girls	179 46.25%	51 13.18%	6 1.55%	65 16.80%	86 22.22%
	Teachers	44 46.32%	35 36.84%	4 4.21%	11 11.58%	1 1.05%
Traditional beliefs and customs makes women to be dependent on men	Girls	249 64.34%	82 21.18%	3 0.78%	26 6.72%	27 6.98%
	Teachers	50 52.63%	41 43.16%	2 2.11%	1 1.05%	1 1.05%
Customary laws, beliefs and customs of the community discriminate women	Girls	299 77.26%	25 6.46%	6 1.55%	13 3.36%	44 11.37%
	Teachers	73 76.84%	2 2.11%	1 1.05%	7 7.37%	12 12.63%
Traditional ideas about roles of women restrict their advancement	Girls	227 58.66%	84 21.70%	23 5.94%	33 8.53%	20 5.17%
	Teachers	56 63.16%	27 28.42%	4 4.21%	4 4.21%	0 0.0%
Domestic workload prevents women from engaging in productive activities	Girls	205 52.97%	89 23.0%	8 2.07%	43 7.8%	59 13.1%
	Teachers	40 43.5%	33 35.9%	6 6.5%	11 12.0%	2 2.2%

The findings of the study indicated that 54.23% of the girls strongly agreed that FGM denies girls and women education necessary for economic and political empowerment. Group discussion with women involved in the study were also in agreement with the statement. Most of village elders disagreed with the statement that FGM denies girls and women education necessary for economic and political empowerment as FGM is only a rite of passage. 28.42% of the teachers strongly agreed that FGM denies girls and women education necessary for economic and political empowerment, while 15.79% strongly disagreed with the statement. The government officers were also in agreement with the statement that FGM denies girls education necessary for economic and political development because after FGM some girls reject formal education and others are forced to drop out of school and are married off by their parents. Further the government officers stated that education given to girls prior to FGM is mainly on gender roles and women subordination. According to the study findings FGM is a tool used by traditionalist to degrade women status in the community. It denies girls and women education necessary for Social, economic and political empowerment.

Most of the girls, 67.70% strongly agreed that early marriage prevents women from acquiring education, training and development skills. Group discussion with women involved in the study were also in agreement with the statement and the village elders agreed on the same. Most of the teachers (62.11%) strongly agreed that early marriage prevents women from acquiring education, training and development skills. The government officers also agreed with the statement and added that early marriage had played a major role in inhibiting women progression both socially, economically and politically.

The study also sought to find out whether traditional institutions elevate men over women. The results indicated that 69.51% of the girls strongly agreed that traditional institution elevate men over women. Women involved in the study also agreed with the statement and added that traditional institution prevents women from ascending to leadership positions. The village elders agreed that traditional institutions elevate men over women and added that leadership among men is God given and women have to be contented with societal roles of taking care of the family. Most of the teachers (56.84%) strongly agreed that traditional institutions elevate men over women. The government officers also agreed on the same and stated that traditional institution look down on women and treat them like children.

On whether customs and beliefs legitimize women subordination 59.69% of the girls strongly agreed on the statement. Women involved in the study agreed with the statement that customs and beliefs legitimizes women subordination as from early age women are taught to be submissive and obedient to their husbands and their role in the society. Any woman who tries to challenge these beliefs and customs is met with violence and is rejected by the community. The village elders agreed on the same and added that women are property of their husbands and will always be inferior to men. Most of the teachers 48.42% strongly agreed that customs and beliefs legitimizes women subordination. The government officers were also in support that customs and beliefs legitimize women subordination as it was very evident in public Barraza were women sit on the ground as men and young boys take the seats, also women are not allowed to talk while standing in front of men and even in dowry negotiations women are not involved. As one of the curriculum support officer stated ***“when I was appointed as a head teacher I could***

not stand in front of the parents to address them, the chairman of the school stood to shadow me so that I could address the parents”.

On the statement that culture of the community does not allow women to participate in decision making 46.32% of the girls strongly agreed with the statement. Women involved in the study were also in agreement with the statement. The village elders agreed on the same and retorted that women are most likely to make wrong decisions and cannot be trusted. Most of the teachers 44.32% strongly agreed on the same. Results from interviewing the government officers were also in agreement with the statement that culture of the community does not allow women to participate in decision making. This was very evident in elections where no single woman was elected and in the families and society where men make all the decisions.

Further findings on whether traditional beliefs and custom makes women to be dependent on men. The findings indicated that 64.34% of the girls strongly agreed with the statement. Women involved in the study agreed with the statement and added that they depend on their husbands in all areas including making arrangement for their daughter's marriage, deciding for whom to vote for and even keeping their identity card. The village elders agreed that women are dependent on men and it is normal, cultural and God given. Results from the teachers indicated that 52.63% of the teachers strongly agreed that customs and beliefs make women to be dependent on men. The government officers also agreed with the statement. According to the study finding women are depended on men in decision making and everything they do it has to be in consultation with their husbands. Therefore, even if opportunities are made available to women they are prevented from exercising their full rights to this opportunities because of their dependency on men and discriminations operating in the society.

On the statement that customary laws, beliefs and customs of the community discriminate women 77.26% of the girls strongly agreed on the statement while 76.84% of teachers also agreed on the statement. Women involved in the study strongly agreed that customary laws, beliefs and customs of the community discriminate women and they have to adhere to this beliefs and customs as that is how they have been socialized and also due fear of being rejected. The village elders disagreed with the statement saying that they are only made to preserve their traditions and uphold their values. The government officers agreed with the statement and added that most of the laws are discriminative. According to the study findings gender discrimination has been legitimized by the society thus limiting women advancement.

The study further sought to find out whether the traditional idea about the role of women restrict their advancement and the findings indicated that 58.66% of the girls strongly agreed with the statement. Women involved in the study stated that most of their time is always taken by domestic chores. They further added that they have to be home early to count the animals as they get home from grazing and ensure they are all in and look for any that is missing. The Village elders agreed that the traditional role of women is domestic. Majority of the teachers 63.16% strongly agreed on that traditional idea about the role of women restrict their advancement. The results from interviewing the government officers were also in support of the statement and further stated that women roles have been restricted to reproduction and taking care of the family.

Further findings of the study indicated that 52.97% of the girls strongly agreed that domestic chores prevent women from engaging in productive activities while 42.11% of the teachers also agreed with the statement. Women involved in the study also agreed that domestic workload prevents them from engaging in other activities as they spend many hours fetching water and looking for firewood. In some cases, the women also look after cattle. The village elders added that women should stay home and care for the family property. The government officers were also in agreement with the statement and added that the area is dry and there is scarcity of water so women spent many hours looking for water. According to the study findings societal roles of women restrict their advancement. Even if opportunities are presented to women the nature of their reproductive responsibilities and burdens of domestic chores which are mostly intensive and time consuming mostly prevent women from equal access to opportunities compared to their male counterparts.

Table 3: Relationship between GBV and Enforcement of Gender Policies on Women Empowerment

Correlations		Influence of Gender based Violence on enforcement of Gender policies on women empowerment	Gender Policies
Influence of Gender based Violence on enforcement of Gender policies on women empowerment	Pearson Correlation	1	.466**
	Sig. (2-tailed)		.000
	N	387	387
Gender Policies	Pearson Correlation	.466**	1
	Sig. (2-tailed)	.000	
	N	387	387

** . Correlation is significant at the 0.01 level (2-tailed).

GBV had a positive, statically significant and high correlation coefficient on enforcement of gender policies on women empowerment ($r=0.466$, $p\text{-value}=0.000$). GBV was confirmed to have a highly positive and significant correlation coefficient with the enforcement of Gender Policies on Women Empowerment in Narok County.

Opinion of teachers and government officers on factors hindering women from being empowered economically and politically

The researcher sought the views of teachers and government officers on the factors hindering women from being empowered socially, economically and politically. On factors hindering women from being empowered socially most of the teachers mentioned discrimination put on women in education and cultural practices that forces girls out of school. Interview with government officers showed that social empowerment among women is faced with many barriers such as gender based discrimination resulting into parents being reluctant to invest in girls’ education and resources of the family being spent on the boys’ education as security for old age. The government officers added that most girls do not complete education in the county. According to the study findings most women in the county

are unable to access education so they are absorbed into the society with no education, skills and knowledge needed for empowerment.

On economic empowerment the teachers mentioned illiteracy among women, restriction put on women by their husbands and the community and lack of funds. The government officers mentioned illiteracy among women as the main factor hindering women from being empowered economically. Other factors mentioned in the interview with government officers were societal roles, lack of capacity to get loans, lack of skills to use the funds, funds made to empower women had not reached the rural areas and corruption in distribution of funds. Based on the study findings illiteracy affects economic empowerment of women as they lack skills thus living them with few choices in their life. Narok County is dry and frequently affected by drought thus there is scarcity of water. Women spend many hours looking for water, firewood and food. The responsibilities and burdens of domestic chores are mostly intensive and time consuming thus preventing women from equal access to opportunities compared to their male counterpart. Lack of funds and corruption in distribution of empowerment funds affected women economic empowerment. Even if the funds were available women could not access them due to restriction put on them by their husbands and also lack of skills to make use of the funds.

On factors hindering women from being empowered politically the teachers indicated main factors as patriarchal society, male chauvinism, powerful traditional institutions that look down on women and illiteracy among women. Interview with government officers who are key informant and involved in implementation of policies revealed factors such as:- illiteracy among women, lack of support from the community, social stigmatization, harassment by counterparts, patriarchal society and male chauvinism. The community disregards the female gender and overlooks the fundamental rights accorded to the female gender. Further to this the government officers indicated failure by government to implement the affirmative action, the one third gender rule and political party act hindered women from being empowered politically. Consequently women are locked out from political representation and participation in decision making in the family, community and the country as a whole. This was very evident in Narok County where most of the administrative posts and teaching post were held by the male gender and no single woman was elected in all the elective posts apart from the women representative. Women are looked out of decision making especially in areas that affect them.

Opinion of Teachers and Government Officers on approaches the government should use to ensure full enforcement on Gender Policies on Women Empowerment

The study sought the views of teachers and policy implementers on approaches the government should use in order to implement gender policies on women empowerment. On women empowerment economically the views included improving women literacy through adult education, providing funds, educating women on the available funds, educating women on available financial resources, providing women with loans without collaterals, ensuring women acquire business and financial skills, making water available and marketing their products.

On women empowerment politically the approaches mentioned were educating women on their rights, educating the community that women can also make good leaders, educating men on women rights, implementing the

affirmative action, respecting and preserving women dignity, protecting women from abuse, violence and humiliation, full implementation of the constitution, enforcing the one third gender rule and political party act, enforcing Family Protection Act and Sexual Offences Act and protecting women from traditional institutions. Further suggestions were that women should be given a public space to challenge unjust behaviors and a leader's voice. Activities suggested by teachers and government officers that could assist women ascent into power were voter education, facilitating capacity building, training female candidates and civic education.

CONCLUSION

From the findings, it was indicated that the policies made to empower women have not been implemented to redeem women from poverty and traditional exclusion especially in rural areas where majority of the affected women live. GBV most of it cultural hindered the enforcement of gender policies on women empowerment. Cultural factor influencing enforcement of gender policies on women empowerment were FGM, early marriage, culture that discriminate women, powerful traditional institutions, patriarchal society, male chauvinism, restriction put on women, dependence on husbands and societal roles. Traditional institutions, customary laws and beliefs played a great role in restricting women advancement. FGM and early marriage hindered women from acquiring education necessary for social, economic and political empowerment. Other factors that restricted women advancement were poverty, lack of funds, corruption in distribution of funds, illiteracy among women and lack of skills and knowledge needed for economic and political empowerment.

The study therefore concludes that illiteracy played a key role in hindering women from being empowered socially, economically and politically. Illiterate women lack skills thus living with few choices in their life and have no knowledge of their rights. Although the situation of women continues to improve, women remain disadvantaged in most areas of the economy and decision making. Therefore, the study concluded that even if opportunities are availed for women they are prevented from exercising their full rights to these opportunities due to restriction put on the by their family and the community.

The study recommends that involved parties should work toward improving women literacy, educating women on their rights and protecting women from GBV mostly cultural. Government and other stake holders to support setting up systems that reduce women work load by giving them domestic services such as water supply. Making funds available and ensuring they reach the intended group especially in rural areas, devolving the funds and educating women on available financial resources, providing women with loans without collaterals, ensuring women acquire business skills and marketing their products.

Participation of women in the political process require a process of mental liberation of the society that remain predominantly patriarchal. The study recommends the government to fully implement gender policies on women empowerment such as the 1/3 gender rule in parliament, Political Parties Act, the 2010 constitution, Kenya National Gender Policy, and all the pillars of Vision 2030. The study also recommends that education and awareness programs from all concerned parties including the media, NGOs, and the government to be put in place to help women understand their place in the society. Protecting women from abuse and humiliation, advocacy against Gender

Based Violence and providing public space for women to challenge unjust behaviors. To assist women to ascent into power the study recommends activities to be undertaken such as voter education, facilitating capacity building, training of women candidates, civic education and giving female candidates a leader's voice.

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Selection of Video Games Using Machine Learning

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Abstract- This paper examines the selection of videogames based on the matched skill set and budget of the gamers. Through analysis of the results using A.I. this paper seeks to provide insight into the interests and genre of the video-games gamers are into these days. This paper also provides an analysis on the correct game which is the best suitable for the gamer with the correct skill set and budget.

Index Terms- Gaming, genres, gamers, decision tree, A.I, games, skill set.

I INTRODUCTION

A. VIDEO GAME PLAYING

Each gamer is extraordinary and thusly will appreciate distinctive computer games. Picking the correct kind is significant for the general delight in the game. Each gamer has an alternate range of abilities and has various interests. For instance, an individual who is keen on just action games will purchase just action games. Be that as it may, if the gamer is keen on purchasing a game having an alternate sort then with the assistance of a choice tree, the gamer can pick the correct game for him/her which will coordinate his/her ranges of abilities.

B. VIDEO GAMING GENRES

There are several genres of gaming.

Role-playing games or RPG's require you to play a role. These games require a moderate to high level of concentration while playing, are designed for hardcore gamers.

Puzzle games were made way back when they didn't have video games. Puzzle games keep these creations 'alive', in a sense.

These games usually focus on one main puzzle, although there are some out there that focus on many different puzzle types, or many similar puzzles. Some brain training games also include puzzles. Puzzles have also been incorporated into many other genres of games and playing puzzle games can help you become better at other types of games.

Gamers who are interested in sports like football, cricket, etc also like to play sports games like FIFA, NBA, etc. Not only people enjoy playing with their favourite team, but they also learn the rules and regulations of the game. Sports games require a separate set of skill set as well. The gamer requires quick thinking to make the right decision that can affect the sport he/she is playing.

II OBJECTIVE

With the sprouting of the computer games industry over the most recent three decades, gaming organizations fabricate several games each year. Regardless of whether it is an action game, mind blocking puzzles or esports. Gamers play computer games as a side interest, to gain as a calling by gushing and partake in rivalry or to discharge pressure. With the economy rising such a great amount in the advanced business, computerized organizations particularly gaming organizations make an enormous benefit as a large number of game copies are sold around the world. With the expansion so popular, bearing games nowadays are costly. Likewise, with numerous games discharging each year, gamers are in a quandary to choose which game is the best for them. Henceforth, this proposed strategy will assist gamers with choosing the correct game as indicated by their coordinated range of abilities and spending budget.

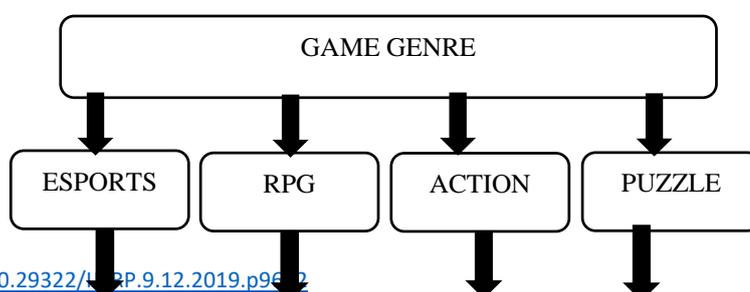
III METHODOLOGY

The attributes of the game like the product necessities, age, rating and the class will as of now be pre - resolved to the framework programming. These necessities will be filled by the gaming organizations themselves. The system utilized for this venture will be a decision tree. The parameters for the decision tree are – genre of the computer game, age of the gamer, required range of abilities of the gamer and the budget of the gamer. Different parameters like past experiences, achievements, interests, etc of games and so on will as of now be transferred to the framework programming by the gamer.

With every one of these parameters the algorithm will ask the gamer on what classification the gamer needs to purchase a game. Regardless of whether it's an activity game, a riddle game or games related with sports. The following inquiry the algorithm will pose to the gamer his/her age. The games will be isolate as indicated by the class and required age. For instance, on the off chance that a gamer is a 10-year-old kid, at that point he won't have the option to pick action games which require an age breaking point of 18 years. The following inquiry the decision tree will pose is the necessary range of abilities of the gamer. For instance, if a gamer has solid scientific outlook and capacity to function as a group then the algorithm will recommend action games as they have both multiplayer mode and requires expository aptitudes. The last parameter of the decision tree is the spending limit of the game.

In the following decision tree, the gamer will already fill in the details into the algorithm like past experiences, achievements and preferred skill set. The first parameter of the decision tree is the genre of the game. The games are classified into 4 parts. In this case, let's assume that the user is a 10 year old kid. If he chooses all the 4 genres, the algorithm will ask him the next parameter which is the age. As it is already mentioned that the user is a 10 year old kid, he has to choose the below 18 parameter. As RPG and action games come under the above 18 section, those game genres will be neglected. The next parameter is the budget. In this case, the user has decided to keep a balance of Rs.2000. Hence the 2 parameters will be of games above 2000 and below 2000. Games coming under the parameter of above 2000 like NBA and Tetris will be neglected. At the end the user has options both from each genre. FIFA from esports category and Candy Crush from puzzles section.

IV DECISION TREE



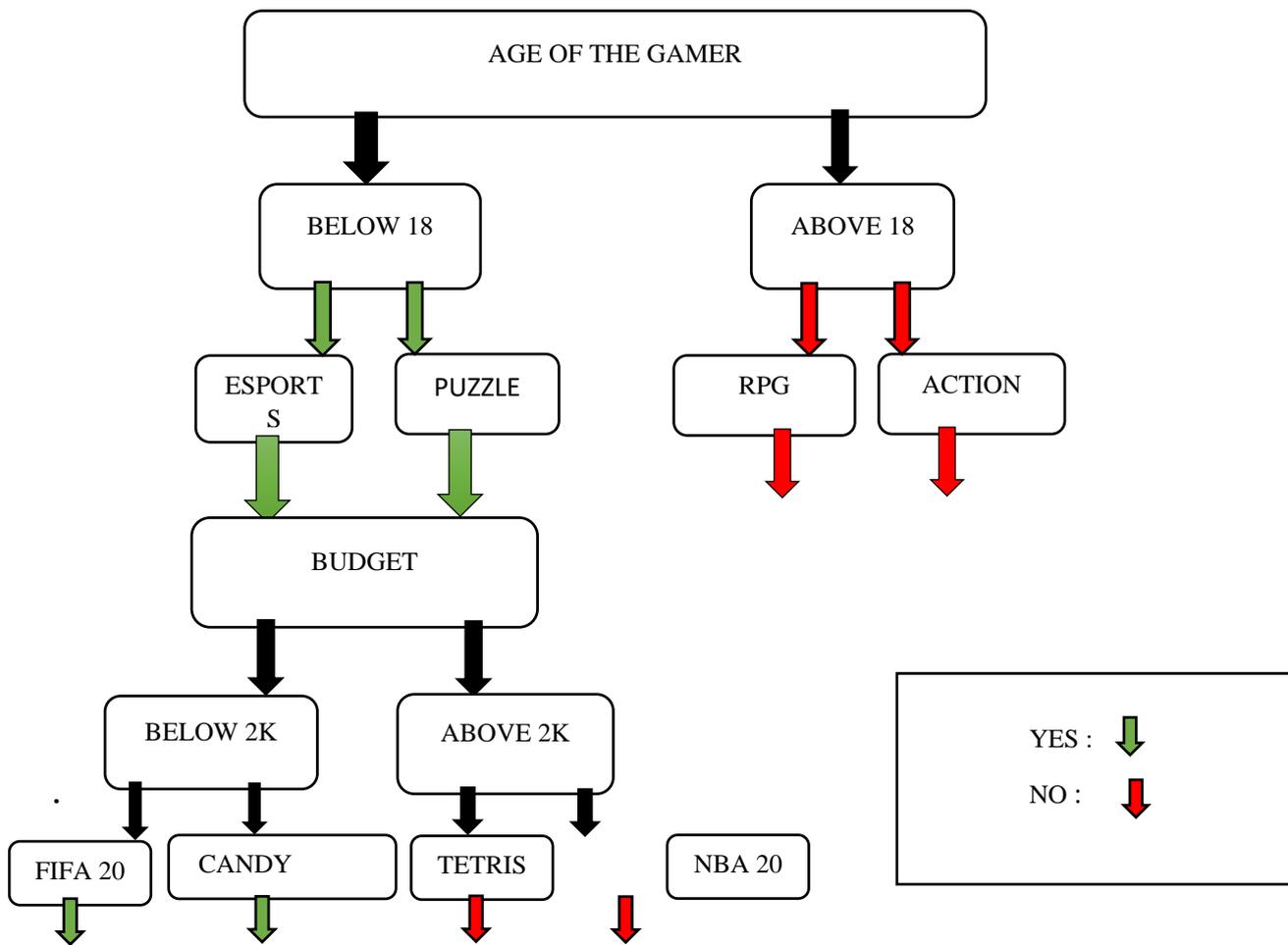


Figure1: Decision Tree for selection of video games.

V CONCLUSION

This paper investigates the system of picking the right game utilizing the utilization of AI. Utilizing the decision tree, the gamer can pick the best appropriate game for him/her. Having the option to partition the computer games into parameters like genre, range of abilities and skill sets, budget and age on how they are picked permits the A.I. researchers to more readily comprehend the capacities of the calculation.

Researchers can likewise study more and exploit these highlights where they can make a product like a software or an application for consumers. In light of this research, the customers can pick the vital game for what's best for them. There is still a requirement for better calculations that can read the requirement for gamers. The data laid out on this paper provides map for building a very robust algorithm portfolio for consumers.

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Smart Industrial Lighting System For Energy Saving Purpose

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Abstract- The most commonly used lighting system includes fluorescent lamps, incandescent lamps, Compact Fluorescent Lamps (CFLs) and Light Emitting Diodes (LEDs). Lighting systems using has become popular because of their attractive properties like long lifetime, less power consumption, more brightness and so on making them good enough to replace the most commonly used lighting systems. Having a way to reduce the brightness with respect to the daylight illumination will help in reducing the power consumption furthermore. This is done in the proposed system in which the brightness of the lighting system using LEDs as light source gets adjusted by using PWM, buck converter and arduino where PWM technique is used to reduce the consumption of power to a noticeable level. The consumption of the power is considerable more during the peak hours than normal hours mainly because of the usage of the consumer electronics by the consumers for various purposes. So that the proposed system helps in maintaining the stability of the network.

Index Terms- Pulse Width Modulation, Light Emitting Diodes, Duty Cycle,

I. INTRODUCTION

Advancing the technology is much essential requirements in day to day life, and it plays an important role in making the world more compact, helping in more secured compact and providing more secured computing life in today's digital world. Now a days everywhere the technology is booming. Day by day there are growing in industrial field and also there are so many achieved milestones in technical field. LED light is a semiconducting light source, when there is a current flows through it emits light.

Early, small incandescent lamps are replaced by LEDs as indicator lamps. Recently technology improved on LEDs and which can produce high output. These LEDs having advantageous such are:

- ❖ They consume less energy compared to incandescent lamp.
- ❖ They are having longer life.
- ❖ Physically they are strong and robust.

- ❖ Smaller in size and compactness.
- ❖ LEDs are faster in switching.
- ❖ LEDs glow brighter with less consumption of power.

1. Research Elaborations :

1(a) Block Diagram:

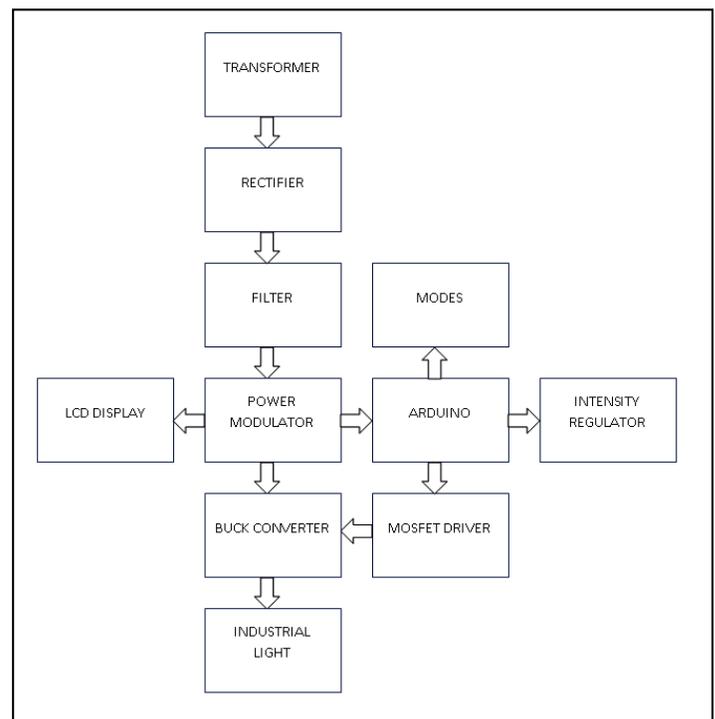


Figure 1: Block Diagram of Proposed System

1(b) Operation:

The block diagram represents the complete information about the proposed project. At starting, the input AC supply is applied to step down transformer, which modulates the voltage from 230V to 12V. The 12V AC power is supplied to the bridge rectifier to convert DC power. The DC supply is applied to voltage regulator

to protect the circuit from over voltage. Voltage regulator protects the Arduino from the over voltage. Arduino Uno is the central processing unit for whole circuit such as LCD, MOSFET driver, PWM and intensity regulator. The overall process is done at the Arduino Uno is displayed with the help of 16X2 LCD display. The 12V DC is applied to the supply of buck converter. The 6V DC voltage is applied to the 7805 IC. These IC is given the constant 5V at the output. Then the constant DC voltage is regulated to 8V by using the L293D IC. This voltage is applied to the power modulator. The power modulator is given the supply to all other circuits. They are Arduino, LCD display, PWM circuit and Intensity regulator.

In the proposed project there are three modes of operations are there and a manually varying the Intensity regulator is placed. This Intensity regulator provides the manual operations of varying the intensity. They are named as Mode-1, Mode-2 and Mode-3. The Mode-1 is used for day time. So in day time the sun light is there and is sufficient to work in the industry. Therefore 0% of duty cycle is applied to Mode-1. Then in morning or evening time sun light is gradually increases or decreases. So 60% of duty cycle is applied to Mode-2. In night time there is no sun light is there, so that 80% of duty cycle is applied to Mode-3. If anyone wants to more brightness then Mode-4 is has to ON. The Mode-4 is Intensity regulator. Adjust the brightness from 0% to 100%.

1(c) Controlling LED brightness using PWM:

Brightness of LED can be controlled using Pulse width modulation. Pulse width modulation indicating that here width of applied signal could be varied. When whole pulse width of signal applied, LED lamp will glow with high brightness and by decreasing pulse width of signal which will directly reduces the brightness of LED. It could be helpful whenever there is availability of light from external source that is sun light then its not needed to make LED to glow with high brightness. Hence, which consumes less power and saves electrical energy.

As now a days electrical energy playing a vital role for almost all applications. Human beings are much dependent on electrical energy. But, generation of electrical energy using different sources not so easy. Here, try has been made to save the noticeable amount of energy.

1(d) Duty-Cycle:

Duty cycle can be defined as ratio of ratio of on time to the total time period. ON time of switch can be maximum when its equal to total time period and minimum value of it is zero. Duty cycle is zero indicates switch always is in open condition over a time period.

Here, switch connects supply and load that is LED lamp. If duty cycle is 40% that means in one period, 40% of time period supply is given to load and if 80% is the duty cycle, switch connects 80% of total period from supply to load. Hence, if more time supply is connected to load, it makes the increase of LED brightness.

This technique is helpful for changing the brightness of LED lamp. In the day time, as the sunlight available there is no need of bright glowing of lamp. Hence duty cycle to be kept at low value. If in the evening or night, due to the darkness the duty cycle to be kept at higher value which makes the lamp to glow with high brightness. In the Figure 2, total time period of 20ms and here T_{on} time that is switch will be ON for 75% of 20ms that is 15ms. Hence during which the current will flows and glows to LED but other 25% the LED is not going to glow. Figure 3 shows the duty cycle of 10%. Here the current can flows only for 10% of 20ms that is 2ms. In remaining time of period the current flows.

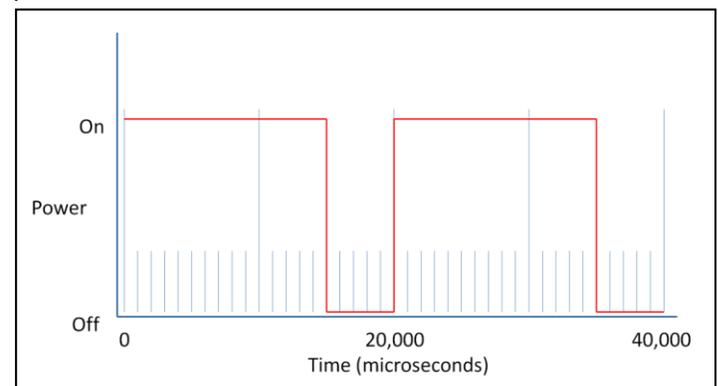


Figure 2: Power v/s Time with 75% duty cycle

1(e) PWM Resolution:

The accuracy with which it can control the duty-cycle is known as the 'PWM resolution'. The higher our PWM resolution is, the more levels of 'brightness' it can display. However, since the duty-cycle is 'fixed' at 50Hz more resolution requires finer timing from the arduino. The faster the arduino, the smaller durations it can time. Another limiting factor is the code execution, the arduino must not only time the 'interrupt' which causes the pulse generation, but also run the code which controls the LED output, which must complete before the next interrupt is called. In addition, it probably want the arduino to be performing tasks other than LED PWM brightness control, so there has to be some spare execution time between interrupts to do all of the other more general processing tasks.

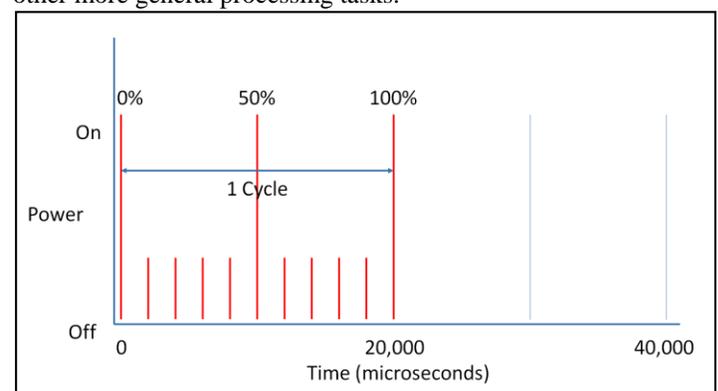


Figure 3: Power v/s Time with 10% duty cycle

III Hardware components:

(i) Transformer:

Transformer is a static device which is used to transfer the power from one circuit to other circuit without changing the frequency.

There are two kinds of transformer. Such are

- (a) Core type transformer and
- (b) Shell type transformer

In Core type transformer windings are surrounded over vertical portion of core which is called limb. In Shell type transformer Magnetic core surrounded over windings. In this type of transformer natural cooling is not preferable and also this type of transformer is applicable for large power applications, hence here chosen core type of transformer.

Transformers are also classified based on voltage magnitude modulations. Such are

- (a) Step up transformer
- (b) Step down transformer

Supply voltage is given to primary winding and other side winding called as secondary winding. In step up transformer, voltage across secondary winding is greater than that of primary winding. And in case of step down transformer secondary voltage is lesser than that of primary. In the proposed work supply voltage 230V AC need to be convert to 12V and hence step down transformer is used.

(ii) Bridge rectifier:

A rectifier is an electrical device that converts alternating current (AC), which periodically reverses direction, to direct current (DC), current that flows in only one direction, a process known as rectification. A bridge rectifier consists of bridge arrangement to achieve full wave rectification. This is a widely used configuration, both with individual diodes wired. The bridge rectifier produces almost double the output voltage as a full wave center-tapped transformer rectifier using the same secondary voltage. The advantage of using this circuit is that no center-tapped transformer is required. The output voltage across the load resistor (+V) of the full-wave bridge rectifier described above has a large amount of ripple. A capacitor filter may be added to smoothen the ripple in the output. In this proposed project 1N4001 bridge rectifier with RC filter is used.

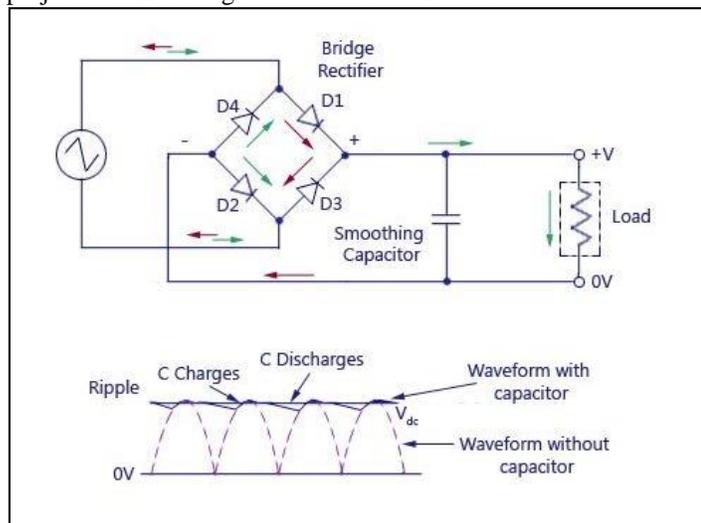


Figure 4 : Bridge Rectifier with RC Filter

(iii) Voltage regulator:

Voltage regulator is to provide constant voltage. This could be used for even operating AC or DC voltages. Power system involves Generating system, Transmission system and Distribution system. The main aim of Electrical service engineers is to provide co constant and continuously supply voltage to the electrical consumers.

The voltage regulators are placed at the substations and in series with the power distribution lines to provide constant voltage. For example, in single phase AC power, supply voltage will be 230volts. If the voltage crosses above the 10 percent of rated value say 250 volts then there could be affect on electrical apparatus. When voltage is below 210 volts, makes more current to flow because of which also affects on apparatus connected. Hence avoiding the fluctuation is much necessary. Here in the present work 7805 voltage regulator is used.

7805 voltage regulator will provide +05 voltage constant supply. Capacitors are connected in the circuit as it will oppose for the rate of change of voltage. Hence maintains constant value.

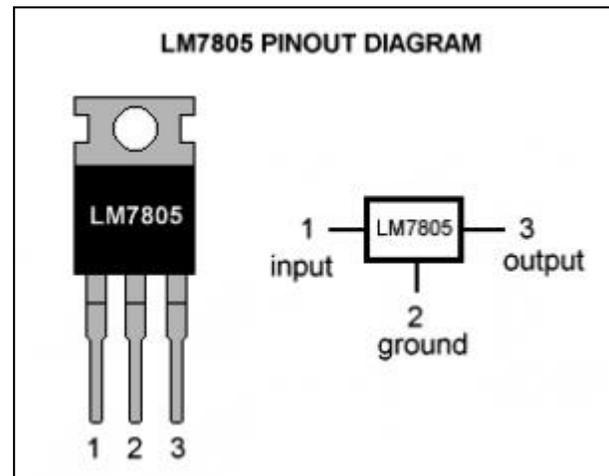


Figure 5: 7805 Voltage Regulator

(iv) Liquid Crystal Display:

Its a flat panel display and for primary form of operation it uses liquid crystal. LCD crystals emit light indirectly that is using backlight. These LCD display can be used for displaying arbitrary images, preset words or digits.

Here, in the present work LCD display used to display the basic things ON, ready then set value of duty cycle. It will be useful in giving the idea about how proportionally brightness varies with respect to duty cycle. It could be helpful for checking the external light availability and with the non availability of external light, LED glows with high brightness.

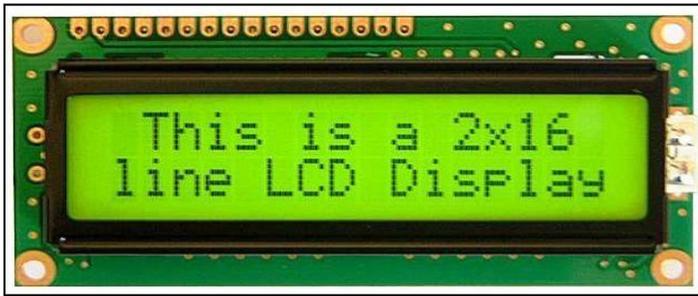


Figure 6: 2X16 LCD Display

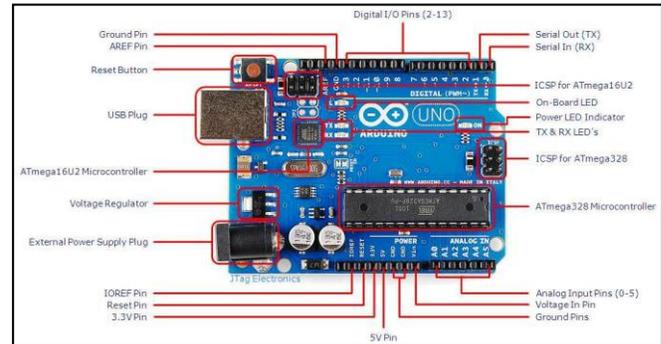


Figure 7: Arduino Uno Board

(v)Arduino UNO:

Ardino UNO is an ATmega 328P based microcontroller board. There are 14 digital input/output pins. Among these 6 pins can be used for PWM outputs, 6 pins can be analog inputs, Quartz crystal of frequency of 10MHz, USB connection, jack and reset button etc.

Technical Specifications of ATmega 328P microchip:

- It can operate at voltage of 5 volts.
- Input voltage which can apply between 7 to 20 volts.
- There are 14 digital I/O pins.
- The DC current flows per I/O pins will be 20mA.
- The DC current flows in 3.3V pin is 50mA.
- It has Flash memory of 32kB.
- The speed of clock is 16MHz.

General functions of pins:

- ❖ **V_{in}:** When external power source is used, voltage can be supply to this pin through power jack.
- ❖ **5V:** Power supplied to board either from 5V USB connector or (7 to 20)V DC power jack or from V_{in} pin, output will be regulated 5V.
- ❖ **3V3:** Voltage generated in board will 3.3V and draws maximum current of 50mA.
- ❖ **LED:** The digital pin 13 drives built in LED. When pin value is kept to high value LED will be ON and when pin value kept to low value, then LED will be OFF.
- ❖ **IOREF:** Voltage reference provided to operate microcontroller from this pin, either it work with 5V or 3.3V.
- ❖ **Reset:** This pin is to add reset button which can block one in board.
- ❖ **GND:** Ground pins.

(vi)Buck converter:

Buck converter is type of DC-DC electronic converter. In Buck converter, the output voltage obtained is lesser than the magnitude of input voltage. But maintains the same power that is output and input power are same. Hence, which makes more current at the output side as power is product of voltage and current. Assuming negligible losses in the circuit.

In the circuit when the switch is closed, current flows through inductor and stores energy in the form magnetic field and it discharges when switch is opened. The capacitor should be selected larger value such a way that value of time constant RC becomes more. Capacitor will oppose for rate of change of voltage and here voltage across capacitor is same as voltage across load.

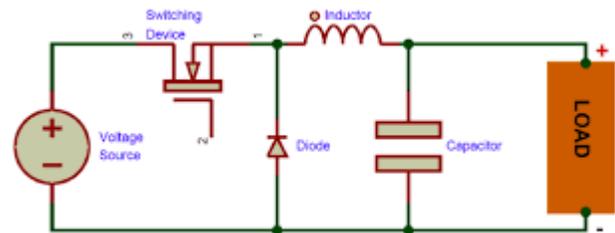


Figure 8: Buck Converter

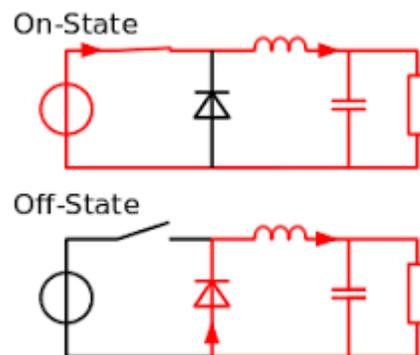
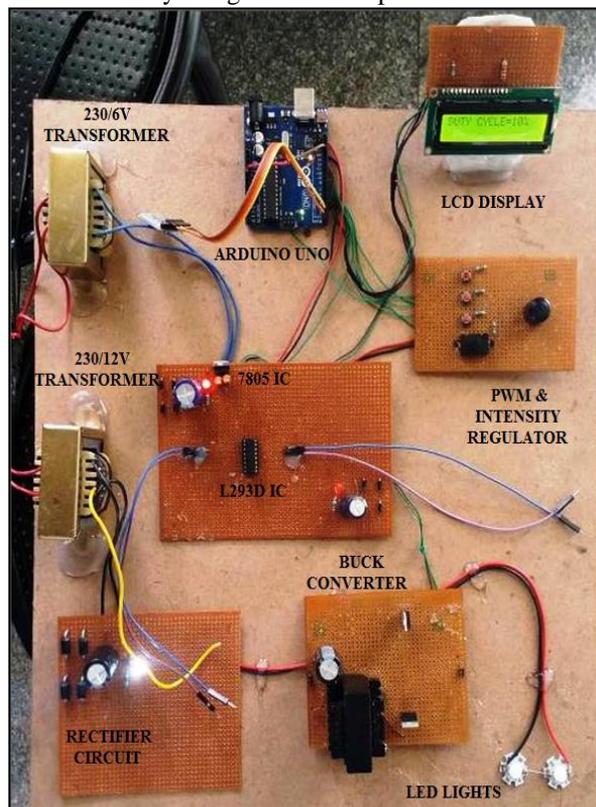


Figure 9: (i) ON state (ii) OFF state

(vii) Model of the project

In the proposed project there are three modes of operations are there and a manually varying the Intensity regulator is placed. This Intensity regulator provides the manual operations of varying the intensity. They are named as Mode-1, Mode-2 and Mode-3. The Mode-1 is used for day time. So in day time the sun light is there and is sufficient to work in the industry. Therefore 0% of duty cycle is applied to Mode-1. Then in morning or evening time sun light is gradually increases or decreases. So 60% of duty cycle is applied to Mode-2. In night time there is no sun light is there, so that 80% of duty cycle is applied to Mode-3. If anyone wants to more brightness then Mode-4 is has to ON. The Mode-4 is Intensity regulator. Adjust the brightness from 0% to 100%. After the switch ON the supply the LCD display shows the name of the project, then select anyone mode to the required intensity in the given three mode and also Mode-4 represents the manual intensity regulator. If Mode-1 is selected then PWM gives the 0% duty cycle is applied to MOSFET gate terminal. Due to this the MOSFET is the switch of the buck converter. So that ON and OFF time is varied. This implies that the charging and discharging is occurred on the inductance of the buck converter. The LED is connected to buck converter as the load. So that by varying the duty cycle intensity of the LED light is controlled and by using this method power is saved.



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Figure 10: Model of the Project

(viii) Conclusion:

Smart Industrial Lighting System is successfully designed and implemented, taking into account visual comfort and energy saving of interior lighting. Controlling LED brightness using PWM and buck converter has been used for an energy saving LED control and trend consumption monitoring. Furthermore a supervision system has been deployed for the monitoring and controls the whole lighting infrastructure. The typical working day scenario has been simulated with the aim to estimate energy saving compared to a solution without sensors.

It can be conclude that proposed project using this technology can implement on real time application towards to make in India. The proposed project in terms of economical cost so it's easily to adopt in real time application. And finally it can be conclude proposed project is most economical and easy to implement and also interface is also very easy so it can be easily adopt this technique for every industry.

(ix) Future work:

Future works are going to be focused on the development of a wireless architecture and in the evaluation of the actual energy saving taking into account the consumption of the chip radio. A valid alternative could be the implementation of the communication between the arduino board and the supervision system.

III. IMPROVEMENT AS PER REVIEWER COMMENTS

As checked from the plagiarism found copied texts which are removed and replaced with original contents.

ACKNOWLEDGMENT

- ❖ I KINDLY THANKFUL TO MY CO AUTHORS AND FAMILY MEMBERS ESPECIALLY MY WIFE.

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Home Automation Using Arduino Uno

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Abstract- Technology may be a never ending method. To be able to style a product exploitation this technology which will be useful to the lives of others may be a immense contribution to the community. This paper presents the look and implementation of a low value but nonetheless versatile and secure mobile phone based mostly home automation system. the design is predicated on a Arduino uno R3 & Bluetooth and also the home appliances area unit connected to the input/ output ports of this board via relays. The communication between the mobile phone and also the Arduino is thru hc 05 bluetooth module. this technique is meant to be low value and scalable permitting style of devices to be controlled with minimum changes to its core. secret protection is being employed to solely permit authorised users from accessing the appliances reception

I. INTRODUCTION

Wireless technologies are getting additional standard round the world and also the consumers appreciate this wireless life-style which provides them live of the renowned “tied to rope” that tends to grow beneath their table . currently with the assistance of arduino uno r3 ,hc-05 Bluetooth module and relays digital devices for a network during which will|we will|we are able to} connect our regular appliances and devices can communicate with one another . Nowadays, home automation is one amongst of} the foremost talked project recently in every a part of the planet .Bluetooth has the most important application in these comes recently. operative over unaccredited, globally accessible frequency of 2.4GHz, it will link digital devices among a variety of 10m to 100m at the speed of up to 3Mbps betting on the Bluetooth device category. With the assistance of this vast technology I propose a home automation system based mostly of Bluetooth technology .

There are few problems concerned once planning a home automation system. The system ought to be ascendable in order that new devices will simply be integrated into it. It ought to offer a user- friendly interface on the host aspect, in order that the devices will be simply setup, monitored and controlled. This interface ought to conjointly offer some diagnostic services in order that if there's any drawback with the system, it will be half-track down. what is more the system ought to be quick enough to appreciate the true power of wireless technology. Finally the system ought to be price affordable so as to justify its application in home automation..

Home Automation

Home automation in something that alter us to use our home's lighting, heating & cooling and residential appliances additional handily and with efficiency.

It is aforesaid even you'll start your home appliances from a far off or from an android device like in our case, the house is claimed to be home machine-driven. every technology has its own distinctive options and advantages, this makes some additional suited to specific applications, while alternative is see for all general home automation installations.

There are few problems concerned once planning a home automation system:

System ought to be scalable: in order that appliances can be superimposed simply

User friendly interface: therefore its straightforward for an everyday person to use it.

Cost Effective: therefore an everyday person can purchase it tha use the technology

Fast: The time interval ought to be quick.

Diagnostic services: If it faces any error its straightforward to seek out it and proper it simply

The projected technique presents the planning and implementation of a strong, low value and user friendly home automation system exploitation Bluetooth technology. the planning of projected technique relies on Arduino board, Bluetooth module, sensors and smartphone application. Bluetooth module HC-05 is interfaced with Arduino board and residential appliances ar connected with Arduino board via relay. Smartphone application is employed for serial communication between smartphone and Bluetooth module that is additional connected with Arduino board. projected technique has ability to not solely remotely manage the appliances however it additionally monitors the sensors. these days most of typical home automation systems are designed for aged, disabled individuals or for any special purpose. The projected technique isn't solely appropriate for aged and disabled folks however it additionally provides a general purpose home automation system, which might simply implement in existing home. an unhearable sensing element is employed for water level detection and soil wet detector is employed for automatic irrigation system to supply additional ease and facilities to users. The projected system has 2 main components hardware and software system. The hardware half consists of 3 main hardware elements smartphone, Arduino board and Bluetooth module. software system part contains Arduino integrated development environment (IDE) and Bluetooth terminal smartphone application that is employed for wireless communication between smartphone and Arduino board. inaudible and soil wet detector also are utilized in this technique to supply additional ease and facilities to the users. Fig. one illustrates diagram of projected home automation system and therefore the flow chart is pictured in Fig. 2.

II. HARDWARE DESCRIPTION AND IMPLEMENTATION

The projected home automation system contains four hardware elements smartphone, Relay boards Arduino board and Bluetooth module. Smartphone is employed to speak with Arduino board employing a smartphone application and Bluetooth technology. during this analysis work Bluetooth module 8Cchannel 5v relay board, HC 05 and Arduino Uno are used for hardware implementation.

A. Arduino Uno R3

The Arduino Uno R3 could be a microcontroller board supported a removable, dual-inline-package (DIP) ATmega328 AVR microcontroller. The R3 is the third, and latest, revision of the Arduino Uno. It's 20 digital input/output pins (of that 6 is used as PWM outputs and 6 is used as analog inputs), a sixteen mhz resonator, a USB connection. Programs is loaded on to that from the easy-to-use Arduino computer program. The Arduino has an in depth support community, that makes it a really straightforward thanks to start operating with embedded electronics. Use USB cable or power it with a AC-to-DC adapter or battery to induce started.

B. 8Channel 5v Relay Board

8-Channel 5V Relay Module. This is a 5V 8-Channel Relay interface board, Be able to management varied appliances, and alternative equipment's with giant current. It are often controlled directly by Micro-controller (Raspberry Pi, Adriano) .as you'll see in figure 3 the semantics of 1 relay is shown. in 8 channel we've got 8 such relays.

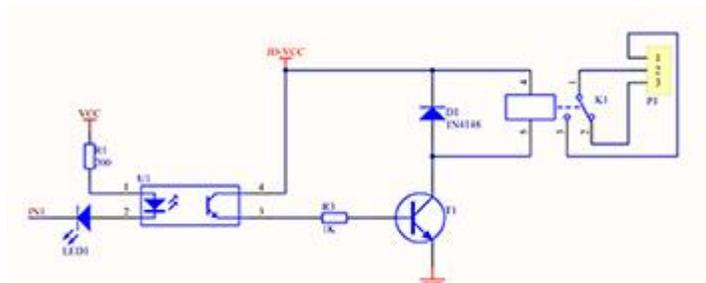


Figure 3

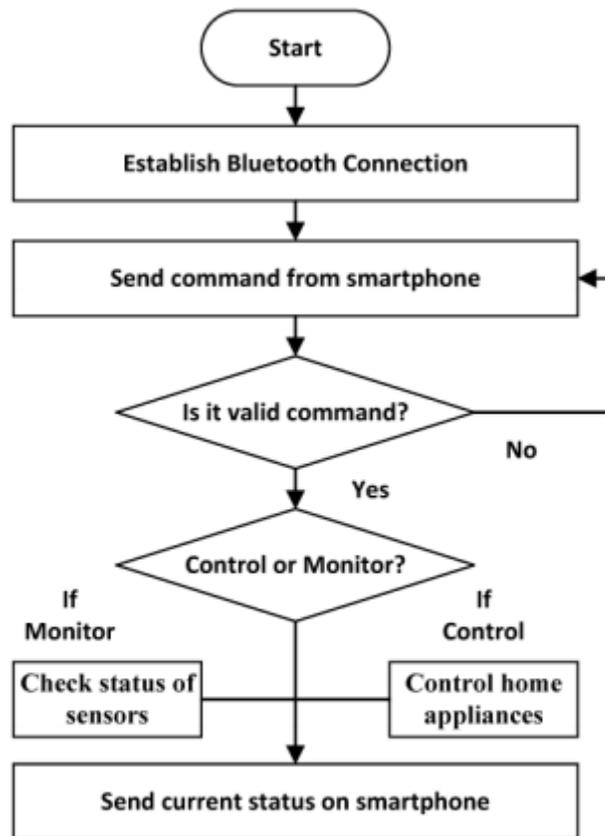
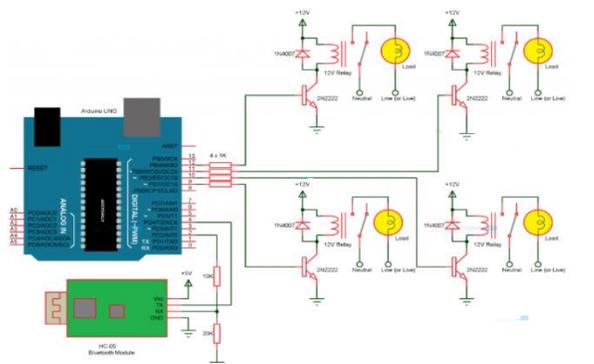


Fig. 2. Flow chart of proposed home automation system

C. HC-05 bluetooth Module

HC-05 module is a simple to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial association setup. The HC-05 may be a terribly cool module which might add two-way (full-duplex) wireless practicality to your comes. you'll be able to use this module to speak between 2 microcontrollers like Arduino or communicate with any device with Bluetooth practicality sort of a Phone or laptop computer. Serial port Bluetooth module is absolutely qualified Bluetooth V2.0+EDR (Enhanced data Rate) 3Mbps Modulation with complete 2.4GHz radio transceiver and baseband. It uses CSR Bluecore 04-External single chip Bluetooth system with CMOS technology and with AFH(Adaptive



Frequency Hopping Feature). There are several automaton applications that are already out there that makes this method a lot easier. we are able to additionally assemble the default values of the module by victimisation the command mode So if you searching for a Wireless module that might transfer information from your laptop or transportable to microcontroller or the other way around then this module may be the proper alternative for you.

D.Implementation

As you'll see within the fig 4 diagram output from the arduino uno r3 is connected to relay board and it works sort of a switch to the 220 Vconnected appliances . The Bluetooth antenna

in our module picks up the packets sent from the mobile phone. later, these packets containing the appliance standing commands are pipelined through ATmega168 microcontroller and therefore the designed analogue electronic equipment in keeping with the definition of every output.

III. SOFTWARE ARCHITECTURE

In we will use two software Arduino Integrated Development Environment (IDE) and MIT APP INVENTER are used.

A. Arduino IDE

IDE stands for Integrated Development Environment, entire programming for proposed system is done in Arduino IDE tool.

Setup

```
void setup(){
  Serial.begin(9600);
  pinMode(bulb,OUTPUT);
  pinMode(AC,OUTPUT);
  pinMode(light,OUTPUT);
  pinMode(Computer,OUTPUT)
}
```

Loop for the code

```
void loop(){
  if(Serial.availab
  le() > 0)
```

Main code for switching the device low and high

if (light == 0 && Received == '1') %if off turns it on

```
{
  digitalWrite(lamp,HIGH);
  light =1;
  Received=0;
}
```

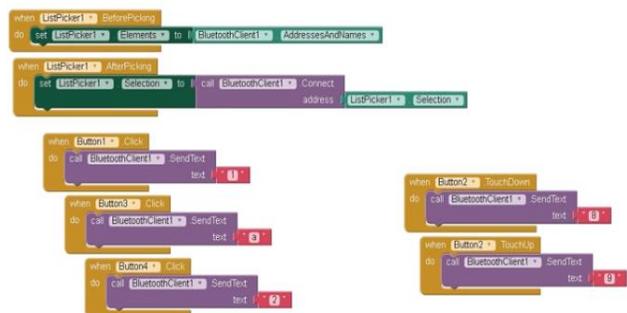
if (light ==1 && Received == '1') %if on turns it off

```
{
  digitalWrite(lamp,LOW);
  light=0;
  Received=0;
}
```

Baud rate is ready to 9600 bits per second for serial communication between Arduino board and smartphone. Arduino IDE command "Serial. Available 0" is employed to receive information serially from smartphone and "Serial.printlnO" command is employed to transmit information serially from Arduino board to smartphone

B. MIT App Inventor

MIT App inventor is an intuitive, visual programming surroundings that permits everybody to make totally useful apps for smart phones and tablets. Those new mit App inventor will have a straightforward initial app up and running in less than half-hour. And what's a lot of, our blocks primarily based tool facilities the creation of advanced, high-impact apps in considerably less time than ancient programming environments. The mit App inventor project seeks to democratize software package development by empowering all individuals, to move from technology consumption to technology creation fig 5.



An android app referred to as arduino bluetooth management is employed for wireless communication between the phone and arduino boards through HC-05 . it's ability to transmit American Standard Code for Information Interchange knowledge serially from smartphone to Arduino board exploitation Bluetooth module. ASCII {standard Code for data Interchange} (American

Standard Code for Information Interchange) is that the commonest format for text files in computers and on the web. In an American Standard Code for Information Interchange file, every alphabetic, numeric, or special character is pictured with a 7-bit binary range (a string of seven 0s or 1s). 128 attainable characters area unit outlined. according to the planned technique user are able to connect eight home appliances..

IV. CONCLUSION

In this paper we've introduced style and implementation of a low price, flexible and wireless solution to the house automation. The system is secured for access from any user or interloper. The users are expected to accumulate pairing secret for the Arduino BT and also the mobile phone to access the house appliances. This adds a protection from unauthorized users. this method is used as a workplace for any appliances that needs on-off switch applications with none web association. the complete practicality of the house automation system was tested and also the wireless communication between the mobile phone and Arduino BT was found to be restricted to.

Figure 6 shows the complete project . Connection are done accordingly .power to arduino relay board and bluetooth HC05 is provided from 12v ac to dc converter.figure 7 shows the working of the project from the application used.



Figure 6

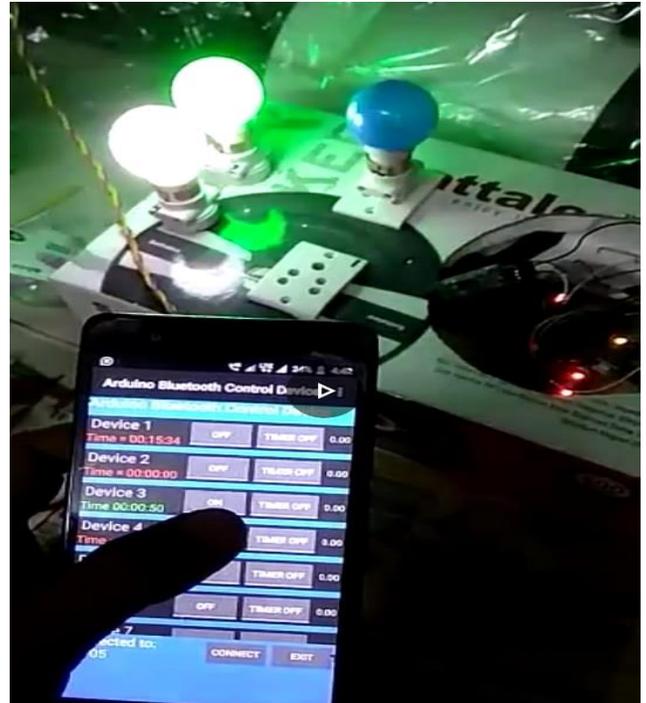


Figure 7

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Application Of Human Resource Management Model Of Fombrun, Devanna And Tichy (1984) On The Performance Of Secondary School Teachers In Maiduguri Metropolis, Borno State Nigeria

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Abstract: This study was designed to evaluate the application of human resource management model of Fombrun, Devanna and Tichy, (1984) on performance of secondary school teachers in Maiduguri Metropolitan. To this end, four objectives were raised, four research questionnaire and four hypotheses were answered. The theoretical frame work on which the research stands, was on Fombrun et al.,1984 model of human resource management which consist of four key component: selection, appraisal, human resource management and reward. The survey research design was used. One hundred and forty-three questionnaires (143) were distributed to eleven (11) secondary school in the Maiduguri metropolis. Descriptive statistical tool of frequency and percentage were used for analyzing the data. In addition, analysis of variance was used to determine the performance of teachers in relation to selection, appraisal, development and reward. The result of the study revealed that Fombrun et al 1984 of model of human resource management has not been fully adapted in the management of secondary teachers. A summary of the extent for application of Fombrun et al, (1984) model of human resource management in the selection of secondary school teachers shows that 31 teachers represent 21.68% strongly agreed and 27 teachers 18.88% agreed while 30 teachers 20.98% were undecided. However, 31 teachers 21.68% disagreed and 24 teachers 16.78% strongly disagreed that the selection process do not fit the culture and requirements of the Fombrun model. In terms of teacher's performance appraisal, result shows that 31 teachers represent 21.68% strongly agreed, in addition 30 teachers 30.98% agreed while 20 teachers 13.99% were undecided. However, 32 teachers 22.38% disagreed and 30 teachers 20.98% strongly disagreed that the appraisal of teachers in terms of position to higher positions is not based on merit. With respect to teacher's reward, result shows that 30 teachers 20.98% strongly agreed and 28 teachers 19.58% agreed while 25 teachers 17.48% were undecided. However, 25 teachers 17.48% disagreed and 35 teachers 21.68% strongly disagreed that teachers are motivated at all. In terms of teachers skill development 31 teachers 21.68% strongly agreed, 21 teachers 14.69% agreed while 33 teachers 23.08% were undecided. However, 32 teachers 23.38% disagreed and 26 teachers 18.18% strongly disagreed that teachers are not given opportunity for in-service training. It was therefore recommended that more effort should be made in full implementation of the Fombrun et al 1984 Model of human resource management by training and re- training of teachers as well as selection of qualified teachers by ministry of Education.

Keyword: Human Resource Management, Appraisal, Selection, Development, Reward

Introduction

Management in general is a continuously evolving phenomenon due to rapid changes taking place in current organization and business today is growing both in size and complexity at a rapid rate being propelled by technological globalization and competitive environment. "Management is a distinct process consisting of planning, organizing, acting and controlling perform to determine and accomplish stated objective by the use of human being and other resource". The advantage of applying management principle lies in the fact that resources are better harnessed leading to the achievement of desired objective faster and more effectively. Human resources refers to recruitment development, training, transfer and retirement of employee from an organization. It is concerned with

people at work and their relationship with an organization. It enables each employee to make his or her best contribution to the success of the organization. The transition from personal management to human resource management was therefore to harmonize work such that the job is not only enrich and participative but rewarding and satisfying (Bello Imam, Oshionebo and Ojeifo 2007).

Human resource Management in education implies effective coordinating the activities of staff, student and parent so as to achieve educational aims and objectives (Adeniyi, 2004) Human resource in the secondary school system refers to the principal, teachers, student and the non-academic staff. The success of any educational program depends, to a considerable extent on the availability and utilization of skilled man power of all types and grade in the entire school system. The demand for better salary more fringe benefit less work by staff and lack of basic infrastructure in the schools are some of the problem the human resource manager has to coup with and manage properly to enable him/her meet the set Goal and objectives of the school system (Peretomode and Peretomode, 2005)

With the advent of strategic human resource management, different model of human resource management was introduced to increase organizational performance. However, there is a myth about the nature and work of life of the average Nigeria teachers, which project the picture of a complacent individual whose sense of responsibility have been dulled by frustration and negativism. Although increased productivity is the gospel practice by various human resource model, only few teachers seems to be dancing to the tone of this music. The objective of the study is to examine how far the Fombrun et al, (1984) model of human resource management has been adapted in selection of secondary school teachers, assess the level of Fombrun et al, (1984) model of human resource management in terms of teachers' performance appraisal, determine how far the Fombrun et al,(1984) model of human resource management has been applied in developing skills of teachers, find out the extent of the application of Fombrun et al, (1984) model of human resource management in terms of reward.

2.0 Materials and Methods

2.1 Study Area

The study area is Borno State, a state in North-Eastern Nigeria with its capital in Maiduguri. The state was formed in 1976 from the split of North-eastern state. Later in 1991, Yobe and Gombe State was curved out of Borno State. The state consists of 27 Local Government. The Kanuri people are the predominate tribe of the Northern and central Borno, while the Southern part is mainly occupied by Marghi, Babur, Chibok and Gwoza people.

2.2 Procedures for Data Collection

The population for his study consisted all secondary school teachers in Maiduguri Metropolis. The sample size was selected through proportionate stratified sampling technique. Primary and secondary sources were used for data collection. The researcher personally administered a total number of (143) copies of structured questionnaire to teachers across the (11) selected secondary schools in the state while published and unpublished journals, magazines and books were used for data collection. 30% of the population in each of the (11) selected secondary school was used in Maiduguri Metropolis as a sample size and random sampling technique was employed to select the required number of teachers from each school bringing the total to one hundred and fourty-three (143) out of the total population of four hundred and seventy-two (472) teachers. The completed questionnaires were collected by the researcher for analysis. The result of this findings is expected to be inferred to the other schools in Maiduguri and Borno state at large.

2.3 Data Analysis

Descriptive statistics were used to analyse the data using frequencies and percentage to present the data. The questionnaires collected from all the respondents were analyzed collectively. To determine the score of each teacher, the sum of his or her responses in all question under each section was determine and percentage taken. In addition, analysis of variance was used to test whether there is significant relationship between teacher's selection, appraisal, development, reward and their performance.

3.0 Results

Table 1. Demographic data and characteristic of the respondents.

Responses	Frequency	Percent
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1-10 years	48	33.57
11-20 years	65	45.45
21 years and above	30	20.98
Total	143	100
Teachers qualification		
Diploma	5	3.50
NCE	51	35.66
B.A ED	47	32.87
B.SC ED	39	27.27
M. ED	1	0.70
Total	143	100

Source: Field survey, June 2019

Table 1 shows the distribution of years of working experience of the teachers. The table shows that 33.57% of the teachers have experience ranges between 1-10years; 45.45% ranges between 11-20years; 20.98% ranges between 21years and above. From the table, it was observed that majority of the teachers working experience lies between 11-20years with 45.45%. this shows that most of the teachers are experienced. Also the table reveals that 3.50% of the respondent are diploma holder; 35.66% of the respondents are NCE; 32.87% are B. A ED; 27.27% are B.SC ED and 0.70% is M.ED. from the table it shows that 60.45% of the teachers are degree holders.

Table 2: Selection of secondary school teachers is based on merit.

Responses	Frequency	Percent
SA	31	21.68
A	27	18.88
U	30	20.98
DA	31	21.68
SDA	24	16.78
Total	143	100

Source: Field survey, June, 2010

Table 2 is a summary of the extent for application of Fombrun, et al., (1984) model of human resource management in the selection of secondary school teachers. Result shows that 31 teachers represent 21.68% strongly agreed, 27 teachers 18.88% agreed that the selection was inconformity with the model, while 30 teachers 20.98% were undecided. However, 31 teachers 21.68% disagreed with the selection procedure and 24 teachers 16.78% strongly disagreed that the selection procedure do not fit the culture and the strategic requirements of the Fombrun model and that, the negative attitude of teachers to work is reinforced by culture of poor selection which is confirmed by Omorogbe and Ewansiba (2013), that there are no qualified teachers in our secondary schools. Poor quality of science teachers in terms of adequate knowledge based and pedagoqic skills is another factor identified to influence students' performance.

Table 3: Teachers are selected for higher positions based on merits promotion

Responses	Frequency	Percent
SA	31	21.68
A	30	20.98
U	20	13.99
DA	32	22.38
SDA	30	20.98
Total	143	100

Source: Field survey, June, 2010

Table 3 summarized the level of application of Fombrun, et al., (1984) model of human resource management in terms of teachers' performance appraisal. Result shows that 31 teachers represent 21.68% strongly agreed that appraisal of teachers' performance followed the Fonbrum model. In addition, 30 teachers 20.98% agreed that appraisal of teacher's performance was in conformity with

the model, while 20 teachers 13.99% were undecided. However, 32 teachers 22.38% disagreed and 30 teachers 20.98% strongly disagreed that the appraisal of teachers in terms of promotion to higher positions is not based on merit. This fact was buttressed by Nwachuku, (1998) when he expresses this clearly with his submission, concerning Nigerian work environment that employees' appraisal is dependent on congeniality, booth-licking and God fatherism and those who are specially gifted to practice this moves fastest in organization hierarchy. In addition, 30 teachers (18.8) strongly agreed that the appraisal of teachers' performance was not in conformity with the Fombrun model.

Table 4: Teachers are given opportunity for in-service training

Responses	Frequency	Percent
SA	31	21.68
A	21	14.69
U	33	23.08
DA	32	22.38
SDA	26	18.18
Total	143	100

Source: Field survey, June, 2010

Table 4, shows the level of adoption of Fombrun, et al., (1984) model of human resource management in development of skills of teachers. The result reveals that 31 teachers represent 21.68% strongly agree, that the Fombrun model been adopted in development of teachers' skills. In addition, 21 teachers 14.69% agree that development procedure follow the Fombrun model, while 33 teachers 23.08% were undecided. However, 32 teachers 22.38% disagreed that the development of teachers' skills is not in conformity with the model, and 26 teachers 18.18% strongly disagreed with human resource development procedure, that teachers are not given opportunity for in-service training and that seminars and workshop are not organized to update teachers' knowledge. This confirms the opinion of Adams' (1997) that some teachers spent above 10 years in the service and have not attended any training or retraining program. Also on many occasion teachers secure admission for further studies and the ministries on many instances either refuses to release the teacher to proceed on in-service training or refuse to pay course allowances and other entitlement.

Table 5: Teachers are motivated through various means like fringe benefit and good working condition

Responses	Frequency	Percent
SA	30	20.98
A	28	19.58
U	25	17.48
DA	25	17.48
SDA	35	24.48
Total	143	100

Source: Field survey, June, 2010

Table 5, summarized the extent for application of Fombrun, et al., (1984) model of human resource management in terms of teachers' reward. Results shows that 30 teachers 20.98% followed the Fombrun model. In addition, 28 teachers 19.58% agreed that teachers are rewarded for excellent performance in their contributions to organizational achievements, while 25 teachers 17.48% were undecided. However, 25 teachers 17.48% disagreed with procedure and 35 teachers 24.48% strongly disagree that teachers are not motivated at all. This proves Muo, (2007) view that salaries and wages of teachers are below substantial levels and that most teachers in the country cannot take care of their basic needs from their emoluments.

Table 6: Analysis of Variance on Performance

	Sum of squares	Df	Mean	F	Sig
Between Groups	6520.426	21	310.496	1.334	0.167
Within Group	28154.567	121	232.682		
Total	34674.993	142			

Table 6 is a summary of the analysis of variance. Results showed that F= (1.334; p. value 0.05; d_f=142). This shows that there is significant difference in the selection process based on the Fombrun model of human resource management.

Table 7: Analysis of Variance Performance

	Sum of squares	Df	Mean	F	Sig
Between Groups	6638.583	26	255.330	1.056	0.404
Within	28036.410	116	241.693		
Total	34674.993	142			

Table 7 is a summary of analysis of variance. Result showed that $F = (1.056; p. \text{value } 0.05 \text{ } d_f = 142)$. This shows that there is significant difference in appraisals of teachers' performance based on the Fombrun model of human resource management.

Table 8: Analysis of Variance Performance

	Sum of squares	Df	Mean	F	Sig
Between Groups	8391.001	25	335.640	1.494	0.80
Within	26283.992	117	224.650		
Total	34674.993	142			

Table 8 is a summary of analysis of variance. Result showed that $F = (1.494; p. \text{value } 0.05 \text{ } d_f = 142)$. This shows that there is significant relationship between teachers' performance and development of their skills based on the Fombrun model of human resource management.

Hypothesis 4: there is no significant different between teachers' performance and reward.

Table 9: Performance

	Sum of squares	Df	Mean	F	Sig
Between Groups	6186.950	19	325.629	1.406	.136
Within Groups	28488.043	123	231.610		
Total	34674.993	142			

Table 9 is a summary of analysis of variance. Results showed that $F = (1.406; P. \text{value } 0.05 \text{ } d_f = 124)$. This shows that there is significant relationship between reward and teachers performance based on the Fombrun model of human resource management.

4. DISCUSSION

The response gathered from the study have shown that the Fombrun et al., (1984) model of human resource management has not been fully adopted in the management of secondary school teachers in Maiduguri Metropolitan Council. The finding reveals that the selection process was not purely based on merit but on favoritism and other factors, that the negative attitude of teachers to work is reinforced by the culture of poor selection, because all sought of people without professional training are found in classroom as a result it becomes very difficult for those teachers to understand the psychology and potentials of their student which is very necessary in choice of effective learning, which is confirmed by by Omorogbe and Ewansiba (2013), that there are no qualified teachers in our secondary schools. Poor quality of science teachers in terms of adequate knowledge based and pedagogic skills is another factor identified to influence students' performance. The selections of teachers are most of the time done in a very careless or cavalier ways.

The study also reveals that, the appraisal policy was not fair, because most of the school principals used teachers' performance appraisal as a mechanism for fault finding or as an avenue to deal with the stubborn and to reward the royal or connected few. This finding is also confirmed by Nwachuku, (1998) submission concerning the Nigerian work environment, where he expressed clearly that "employees" appraisal is dependent on congeniality booth-licking, and god-familiarism and those who are specially gifted to practice this move fastest in the organization hierarchy".

Furthermore, the result revealed that teachers condition of service is very poor, that teachers are denied of promotion, deprived of fringe benefits and kept outside decision in the school. This study was in line with previous researchers in the field such as Bello, et al., (2007) who expressed their views that the needed tools for performance are virtually non-existence in schools and that salaries and wages of teachers are below sustenance levels and most teachers in the country cannot take care of their basic needs from their emoluments. Also, the result on development of human resource reveals that there was no adequate provision for training and re-training of teachers to update their knowledge, that on many occasion teachers secured admission for further studies but the ministry of education on many instances either refuses to release the teachers to proceed or refuse to pay course allowance or other course entitlements. This study was confirmed by Adam, (1997) assertion that some teachers spent above 10 years in the service and has not

attended any training or re training programs. Also, the result of analysis of variance on the performance of teachers in relation to selection, appraisal, human resource development and reward showed significant relationship. This shows clearly that, the teachers of perform effectively, the four key components (selection, appraisal, human resource development and reward) of Fombrum *et al.*, (1984) model of human resource should be fully adapted.

4.1 CONCLUSION

From the finding of the research, it can be concluded that the Fombrum, et al., (1984) model of human resource management has not been fully adopted in the management of teachers. The finding revealed that, selection process was not purely based on merit; appraisal policy was not fair; there was no provision for training and re training of teachers to update their knowledge and there were no benefit and welfare services to boost their morale. Also, the result of the analysis of variance reveals that there is variable relationship between selection, appraisal, development, reward and their performance.

4.2 RECOMMENDATIONS

1. Efforts should be made by the ministry of education to base selection of teachers on merits and previous academic training of teachers should be taken into consideration in order to place them according to their area of specialization.
2. Training and re training facilities should be given to teachers by the ministry of education in service training program as well as on job training should be encouraged to add to their professional qualification. In addition, seminars and workshops should be organized on regular basis by the ministry to update their knowledge.
3. Productivity to a large extent depends on the working conditions of job; therefore, human resource managers should view teachers as the most valued asset in the organization by rewarding them on the basis of their performance so that visible relationship exist between performance and reward.
4. Principals of secondary schools and administrators should have leadership style that will carry the teachers along with them to achieve the set school goals.
5. Teachers performance appraisal should be based on merit as to provide data for future training needs and for promotion to higher positions as promotion is one of the necessary factors in improving productivity because it brings mark of recognition to the individuals.
6. Performance appraisal of teachers should be ethical and objective so that workers, performance is measured as accurate as possible instead of being used as avenue to deal with stubborn staff to reward the royal or connected few.
7. Government should keep abreast with modern strategies in managing teachers in work place. More effort should be made in adoption of Fombrum, et al., (1984) model of human resource management practice to enhance productivity.

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A Study on Effects of Training in an Organization

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Abstract- In this modern or developing India the competition is increasing day by day so to achieve the target of organization it is necessary to provide the training to the employee because it helps in increase the morale and motivation of employees which is a boost up for organizing.

Training - training is a process by which a development is done in employee within specific field. The study context was based on hypothesis

I. LITERATURE REVIEW

It means that every author have different choice and have different point of view regarding every thing so I have taken some writers point of view regarding training.

In the words of Dale S. Beach, "Training is the organised procedure by which people learn knowledge and Improve skill for a definite purpose."

It means that training is provided to the employees to increase their skills and make them perfect or experienced in different fields.

In the words of Michael J. Jucius, "Training is a process by which the aptitudes, skills and abilities of employees to perform specific jobs are increased."

It stands for that in training first of all the aptitude skills of the employees are checked and they will give training as per his skills and attitude knowledge.

According to Edwin B. Flippo, "Training is the act of increasing the knowledge and skill of an employee for doing a particular job."

It stands for that when an employee joined the organization he have little bit knowledge of the organization but when an employee joined by experienced or by giving them proper training their skills will increased.

In the words of Dale Yoder, "Training is the process by which manpower is filled for the particular job it has to perform."

It stands for that when training is provided to the employees their skills is developed and become experienced in the field so because of which the organization try too filled the uper post with them.

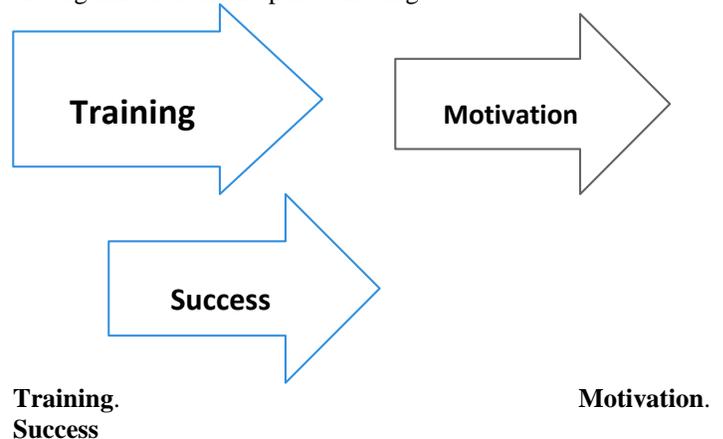
II. INTRODUCTION

Every organization is established to earn profit and to earn a Goodwill in the market so that they can survive on this compitative world .In this changing world it's not easy to survive by completely depend on traditional technology .Technology is changing very fastly so without using it or came to knowledge of employees it's

difficult for them to use it and because of which it's difficult for an organization to survive in this compitative world . Training is basically done to improve the knowledge of the employees in which field they are working training only focus on a specific area of employees . Training is basically good for organizing as well as for the employees because when we provide training to employees they get motivate they think that organization is thinking for them and because of which they work hard and which is good for the organization.

III. TRAINING AND MOTIVATION ARE CORELLATED

An organization is totally based on employee and customers so it's the duty of an organization to take care of them . Motivation means a process by which the morale of an employee is increase. So when we provide training to the employees their knowledge in that field is increase which create in their mind that organization is thinking for them and because of which their morale is increased which create in their mind that we should also have to do work hard for the organization and when the employees start working hard for the organization which is a positive sign for the organization and help in achieving success.



As shown in diagram that training and motivation are correlated and when we achieve the motivation of employees the success of the organization is automatically achieved.

IV. TRAINING AND DEVELOPMENT

Training and development both are different training is a process which only focused on a specific field means it developed only those skills of the employees which is necessary for him too get promoted too next level but the development means an overall

increase in the efficiency of an employee it doesn't focus on a specific field it increase the overall skills of an employee

Benefits of training

- A .It increase the morale and motivate the employees
- B. It focused on specific field of the employee
- C. It help in achieving success

Benefits of development

- A .It helps in long term basis for employees
- B .It focus on overall increase the skills of employees
- C .It helps the employees outside the organization also
- .It also help when the employees shifts to the other organization



IDENTIFICATION OF WHY TRAINING IS NEEDED ????????

Every work is done because of some reason behind it so there are many steps to check whether the training is needed for the organization or not.

1. Set objective

- 2 . Set principals
- 3 evaluate the result
- 4 action

The above 4 steps define that how to identify that training is needed for the organization first of all we should set the objective for the organization after that we should set some principals too achieve it and after that we should evaluate whether we should achieve the target of the organization or not if we can't achieve the target it means that is needed for the organization .It doesn't totally based on the training sometime it based on the planing also what to achieve ,how to achieve and when to achieve we can't totally focused on training.

Basis of training

It means that on what basis the training is given to the employees obviously the experienced employees need less training and new joining employees need the more.

A . To new employees

The training to new employee is given only just to introduce him to the organization or to make him clear all the rule and regulations of the organization whom he have to go ,how is subordinate and who is superior basically the simple objective of this training is to make him familiar to the organization.

Eg :orientation

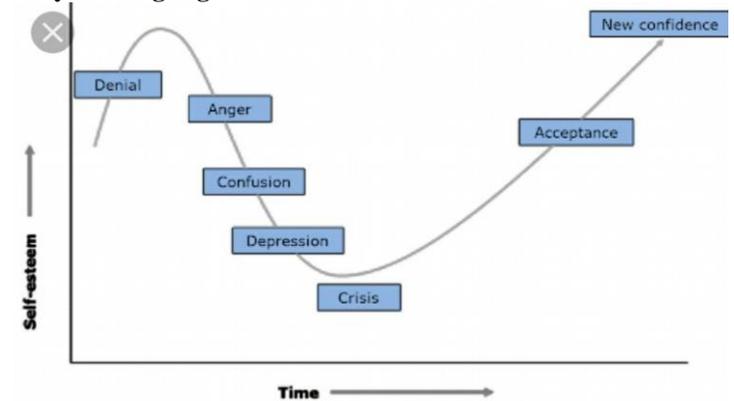
In this on first the employees are make to familiar about the organization,just shown who is subordinate ,where you have to work,how to work and so on

B. To Existing employees

The employees who is working in the organization clearly know what to do ,how to do but In this competitive world the technology is changing day by day and the rule and regulations of the organization is changing as per the Changing environment because the training is given too the employees so that employees become familiar to it

Eg: when there is changes in government policies the whole organization is disturb so because of which very thing is change so to make familiar to it training is given.

Why training is given ?



A. Employees oppose to change

When the technology is change the employees came in to fear that their position will not be snatched from them because it's difficult for them to learn it that's why they oppose for it a trade Union is framed by them .

B. Employees left the organization

When something new technology came in the market everything got changed in the organization because of that they think that it's difficult for them to learn they think that think that they can no do that's why they left the organization.

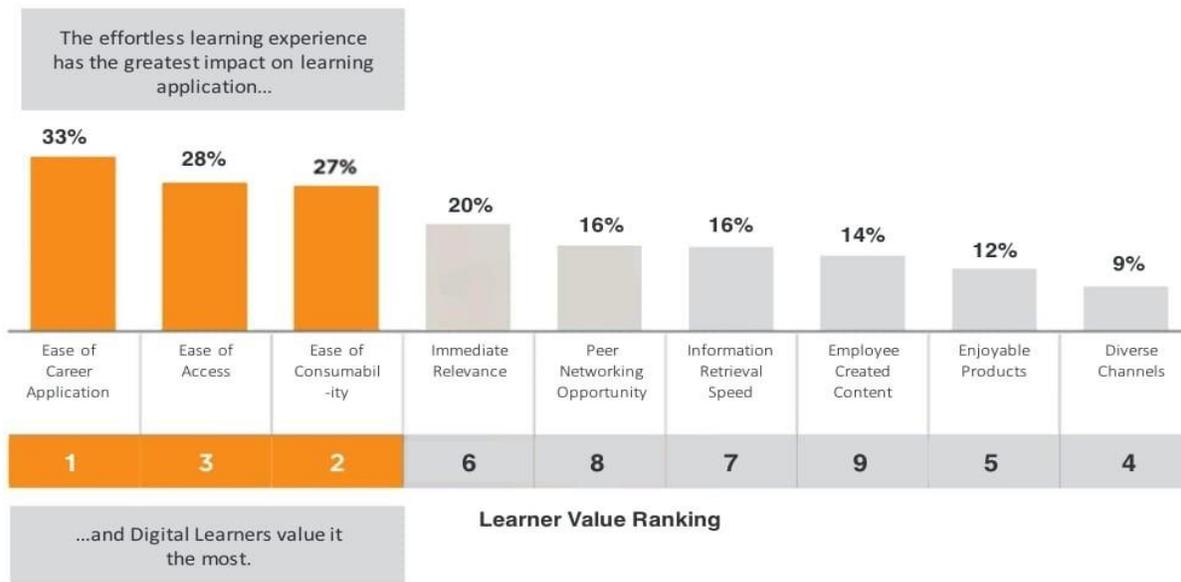
C. Morale decreases

When a new technology arrived employees get into fear how to use it because of that fear it's difficult for them to work and their morale decrease

D . Dedication toward work decrease

when something new come in the organization the employees is not familiar to it so without training is their dedication toward work decrease because they don't know what to do how to do ,when to do

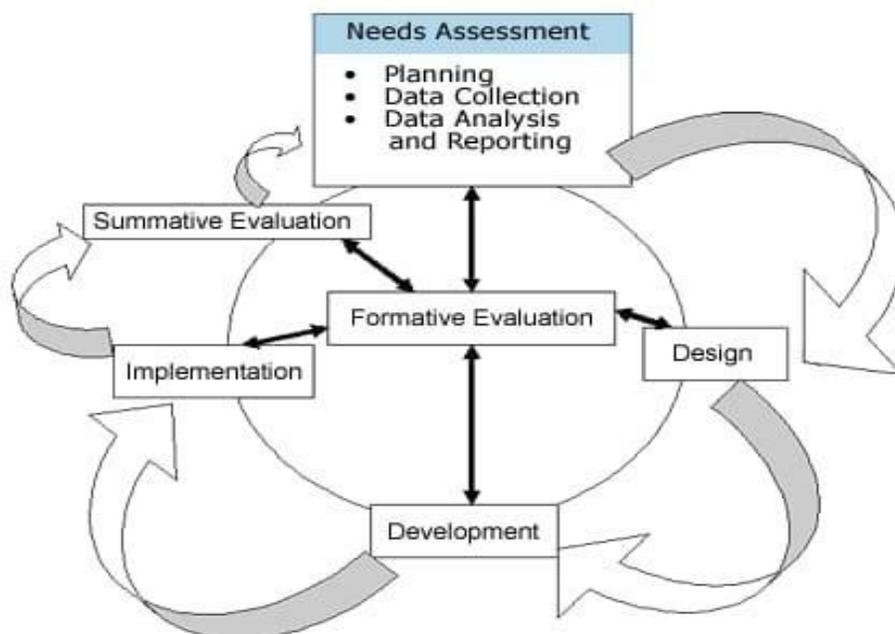
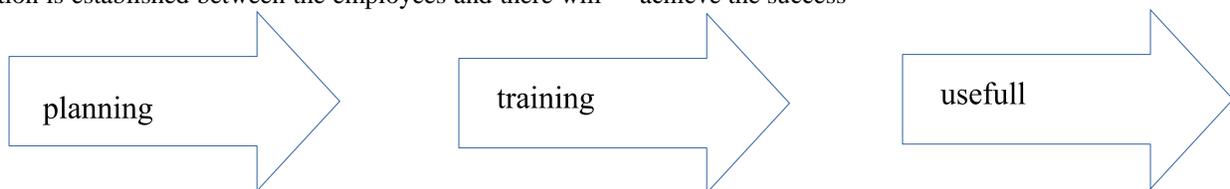
Trends of learning in organization



Training is useless without planning

Planning is to achieve something and without planning we can't achieve something so training is given to employees because to make them clear about something new when a proper planning is done what to do, how to do, when to do then a proper coordination is established between the employees and there will

be no hustle and bustle because when we don't know why a training is given, whom to give it is useless for to make the training successful it is necessary that a proper planning is made **PLANNING IS KEY TO SUCCESS**. Planning provide direction to the organization which show a path at which you have to go and achieve the success



Types of training

A .On the job training

B.off the job training

1. ON THE JOB TRAINING

In this type of training as the name suggest that the training is given during the job the person is trained while he is doing his work he will taught how the work is done and how to operate the machine .

Eg: IN an organization a superior is provided to the subordinate so that he will taught him what to do and how to do

2 .Off the job training

In this type of training the person or the employees are taken away from the job and he will trained there the person is taken to the skilled or well trained superior so that they will make them understand how the work is done .

Eg : seminar is done outside the organization in which many experienced people taught them how the organization work is to be done

SOME OTHER EXAMPLE OF TYPE OF TRAINING

1.JOB ROTATION

In this type of training the employees are work with the uper level employees so that they will become familiar to the work of the organization and if the employees of the uper level in the organization will not come in future because of some reason they will on leave therefore ,the lower level employees will handle the work easily .

Eg : this type of training is Generally given in banks when in the bank the uper level employees will not come than the lower level employees will easily handle the work .

2 COACHING

This envlove that the more experienced employees were coach the lower level employees .this practice doesn't means that the experienced employees were out from the organization they will taught only because to make them understand the work.

3 . ORIENTATION

In this type of training the newly joined employees were taken to a place on the first daya and make them familier about the rule and regulations of the organization , policies of the organization , relationship of employee and where they have to work .This type of training is mainly for the fresher employees.

4 Confress

In this type of training a large unit of employees from all over the world were given an lecture from the experienceced or from the renowned person who have knowledge about that.

5.ROLE PLAYING

In this type of training employees are allow to act out work scenarios .In this the employees were shifted to the other employees post so that it become familiar to it and in case some other employees will not came than the organization will not face any problem.

6 buddy system

In this type of training the employees are given one old employee who taught them all the work and make familiar about the work for a specific period of time.

PROCESS OF TRAINING

1 identification of training needs

2.Setting objective of training 3.Defining polices

4 Evaluating the results

5. Action

1 . Identification of training needs

In this steps first of all training needs are found out why we have to give training ,what problem the organization is faced ,in which department the training is given this all problem is studied out in this steps .

2 SETTING OBJECTIVE OF TRAINING

In this step the objective of training is set up what we will want to achieve in future by diving training to the employees because once the objective is set it the clear view for the organization which help in making the work easier.

3. Defining policies

In this step an policies is framed so that a proper training is given to the employees they will get a proper arrangements of platform where they get training.

4.Evaluating the results

In this steps the outcome of training is judged whether we get benefits of training or not .Is our efforts are successful or we need some more .

5 Action

In this step when every is checked we will focus on that area where we fails and find out the reasons why we will got fail and a proper action is taken on that for better future .

Importance of training

A .Helps in achieving result faster

It means that when give training to the employees the employees get motivated and they will work hard and help in achieving the result fatser

B.Increase morale

When the employees are given training it is because of their benefits so because of that they think that organization show some concern regarding us so we have to work hard .

C.Motivate

It means that when the employees are given training their skills are developing so because of which they will get motivated .

D.Decrease absenteeism rate

It means that when the employees are given proper training they will get to know what to do and how to do so the fear in their mind will decrease and they will stop taking leave which is a position sign for the organization.

E.Increase skills of employees

It means that when we give training to the employees they will get to know about new skills and their knowledge will get automatically enhance.

F.Decrease expensive

When the employees are given proper training so the old employee will retain to the organization they feels like a family so because of which organization didn't need to recruit new employees which is very expensive process.

HOW TRAINING AFFECTS PRODCTIVITY ?

There are two types of employees in the organization trained or not trained when the employees are well trained they will automatically get worked hard for the organization and because of which productive is increased therefore organization can achieved

his goals successfully but if the organization have untrained employees in the organization the whole organization will get disturb and at a point a situation came the organization have to wound up.

National Center on the Educational Quality of the Workforce conducted a study of more than 3,100 U.S. workplaces and found that on an average if there is an increase in workforce education by 10%, it will lead to increase in productivity by 8.6%.

Training increase employees productivity

a).Employees get new skills

When the training is given to the employees get to know what the organization want from them how organization is helping them when the employees get under training process they will get many new things from it which helps them in increase their skills.

b). Employees get more confident

When the employees get to know how to do the work and what to do because of which their work become easy and as they become comfortable with the work they get confident automatically therefore ,they will work confidently and according which is a good sign for organization.

c).New employees get charged

Training is the process which make the fill comfortable to the new employees if without training they will get to work they will be narvous and can't work hard so training helps them to fill confident and get motivated them.

d)Helps in continuing the employees

Due to the competitive world the technology changes day by day and it's very difficult to make a new recruitment of employees because the whole organization get disturb and when the training is given to the new employees they will automatically get skilled and the employees didn't have to quiet.

e).REDUCES EMPLOYEES ABSENTEEISM RATE

Training is the process which create a confident in employees mind which reduces the stress of the employees they will be happy to learn the new things from the organization they will get a friendly nature which reduces absenteeism rate.

f)EMPLOYEES GET MOTIVATED

It means that when the employees are given proper time to get taught or to make them Learn about the thinks which create in their mind that the organization is thinking for them and because of which they get motivated.

V. METHODOLOGY

When we do research it's not be possible by sitting at once we should some effort to find out the proper knowledge of the topic because I personally used questionnaire method of research.

.Questionnaire

In this I had made a questionnaire and asked many questions from the employees of the organization questions are given below

1. Which type of employees are working in the organization ?(In term of qualification)
A. Graduated B. Post graduated
2. Why type of employees are working in the organization (In term of working)
A.full time worker. B. Part time
3. Which type of training is given to employees?
A. On the job. B.off the job
4. Is productivity of employees increase by training?
A.yes B.No
5. Employees are satisfied with this types of training ?
A. Yes B.No6. Is this is sufficient to motivate the employees? A. Yes. B.No
7. Whether Employees get benefits from this ?
A. Yes. B.No
8. How many Employees resist to change ?
A. Less than average B. More than average
9. Is Training helps in achieving the target fast ?
A. Yes. B. No
10. Is employees skills get boost up from training?
A. Yes definitely
B. Some how
C. Not ,at all

ANALYSIS

In this method as I went there in the organization I personally observed many things ,as you know that for to know something about the organization it's necessary to gain some knowledge about them so personnel observation was the best because when I personally visit there I show many employees were happy but some are not at all interested and there is no coordination between the employees its possible to observe only when you visit there.It stands for that what I get to know after observing all the things personally and researching on it when a person do research on something it's not possible to represent all the information on the paper but somehow I represent some of the information as in the form of chart.

Table 1. training program policies

Education	No. Of employees	Types of training given
Graduated	25	On the job
Post graduated	15	Off the job

In this table it shows that how many employees were there and which types of training is given to them.

Table 2 preference of training

Employees type	No of employees	Prefrences
New employees	20	Less
Old employees	50	More

This tables shows that there are two types of employees in the organization and it's difficult to give equal preference to all so this show the preferences.

Table 3.Effects of training

Objective	Achieve fast	Upto 50% faster
Result	Increases	10 times
Absenteeism rate	Decrease	40%

This table show that how the training give changes to the organization before training it's difficult for organization to achieve the result but after training the organization get result fast.

Table 4. performance of employees

Performance	Results
Trained	Increase
Un trained	Decrease

In this table it shows that the performance of employees when the employees get trained and when they didn't get trained.

VI. CONCLUSION

As the title suggest that the training as a backbone of organization . Training is given when new employees joined the organization or when something new came in the market so training is the only process which helps in both the cases when someone came training is only help to make him familiar about the things and feel him comfortable in the organization . The employees are not the God they will automatically get to know how to operate the new machine obviously it's the duty of the expert to make the employees familiar about the technology. Training is best way to motivate and to get the results faster these are interrelated when we give training to the employees the employees feels that the organization is showing some concern

toward them which will charge them and motivate them and if the employees get motivated then they will automatically work hard for the organization which is a positive sign for the organization. In simply without training the organization is in danger and that's why I suggested the tittle training as a backbone of the organization.

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Strategies to improve weaving cloth production to support Betang Long House tourism in Sintang, West Kalimantan, Indonesia

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Abstract- Research on efforts to improve weaving cloth production to support Betang Long House tourism was conducted in Ensaid Panjang Village, Sintang, West Kalimantan, Indonesia. This study adopted a qualitative approach. A data collection technique was done through interviews, and direct observation. A series of in-depth interviews were conducted to explore all forms of individual or collective idea, perception and experience concerning potential of tourism and cloth woven development. The interviews were done with seven key persons, four men and three women. The selected informants were those who have knowledge, experience, cadence, position in the cultural context in which they live. With the knowledge criteria of the culture in which they live, the selected key persons were consisted of the head of weaving head (I1), an elder of weaving (I2), sub village chief (I3), chairman of village consultative body, a tribal chief (I4), an elders of Betang Long House (I5), former tribal chairperson (I6) and the Secretary of Tourism Office (I7). Result of deep interviewed was discussed in focused group discussion forums to form the strategic analysis. In making woven fabric there is no difficulty in obtaining raw materials and sales, however in terms of marketing and the fabric design process it is still lacking in innovation. For this reason strategies need to be developed include a) Guidance for innovating and diversifying woven fabric products to make accessories, caps, jackets, etc.; b) It is necessary to increase the role of traditional institutions to better support the ikat industry through fostering and establishing cooperation; c) Establishment of a tourism awareness group that can develop marketing of woven fabric products that is realized in the village regulation; d) Efforts to determine forest areas for the preservation of natural coloring plants.

Keywords: Dayak tribe, interview, tourism, weaving cloth

I. INTRODUCTION

Ensaid Panjang is a village located in Sintang Regency, West Kalimantan, one of the outer districts bordering between Indonesia and Malaysia. Efforts to improve the quality of human resources and the production process especially in the outer regions are very strategic to increase national resilience [1]. Socio-cultural and ecological potential in Ensaid Panjang is quite huge. The population reached 544 people consisting of 293 men and 251 women, which most of them pursue the field of woven fabric production and agricultural cultivation [2]. The agricultural sector contributes the biggest income, consisting of plantations (rubber and palm oil) and lowland rice. The most important family economic sector is the woven fabric industry. Most of Ensaid Panjang Village lives in the Betang Long House.

Batang Long House is a large and elongated traditional house that forms a characteristic in which the practice of life is developed based on the values of local wisdom [3]. One of the leading art/cultural products based on the local wisdom of producing woven fabrics. The procedure of making woven fabric becomes a daily activity occupied by women in the house [1]. Problems that are used by residents of the Betang are marketing management and the role of Dayak tribe institution to support weaving product, marketing and tourism of the long house.

To overcome the problems, efforts to improve the quality of human resource capacity to handle tourism continues to be implemented. Previous research has suggested that tourism potential must be developed, through supporting infrastructure development [1]. In addition, cultural potential must also be developed so that it can be a social capital

for supporting the people living in Betang Long House [2]. However, tourism management problems are also faced by residents in the long house. Because of this, this research is focused on efforts to formulate improve weaving cloth production to support Betang Long House tourism was conducted.

II. METHODS

This study was conducted from April to July 2019 in the Betang Long House of Ensaid Panjang Village, Sintang Regency, West Kalimantan. The location distance is about 32 km away northeast capital of Sintang District. This adopted an action research with a project-based learning approach. Action research activities start from the initial survey of community needs. A data collection technique was done through interviews, and direct observation. A series of in-depth interviews were conducted to explore all forms of individual or collective idea, perception and experience concerning potential of tourism and cloth woven development. The interviews were done with seven key persons, four men and three women. The selected informants were those who have knowledge, experience, cadence, position in the cultural context in which they live. With the knowledge criteria of the culture in which they live. The selected key persons were the head of weaving head (I1), an elder of weaving (I2), sub village chief (I3), chairman of village consultative body, a tribal chief (I4), an elders of Betang Long House (I5), former tribal chairperson (I6) and the Secretary of Tourism Office (I7). Result of deep interviewed was discussed in focused group discussion forums to form the strategic analysis.

III. RESULTS AND DISCUSSION

From the results of the focused discussion it was known that the raw material for woven fabric is obtained from the JMM Cooperative Institution raw material (self-weaving services). This was stated by informant 1. She said that

"We have never had difficulty in obtaining raw materials, because woven fabric raw materials are obtained from JMM Cooperative Fabric Raw Materials (self-weaving services). The showroom is located in Sintang; Jl Hutan Wisata Baning, Gallery of Dara Kumang, or *Disperindakom* (Office of Industry, Trade, Cooperative and SMEs) Gallery. All women become members of the cooperative, making it easier to obtain these raw materials (I1)

In making woven fabrics, unfortunately, the use of natural dyes is rarely done. All of woven worker use synthetic dyes. This was stated by informant 2.

"Natural dyes are rarely used, because orders are sparse, raw materials have begun to be difficult to obtain and processing is time consuming." (I2)

Several women expressed their obstacles to obtaining raw materials due to transportation and the holiday time. Informant 1 expressed their feeling.

"We must be dependent from men, because men may operate the vehicles. In case the thread runs out there is a mobile message notification." (I1)

Another informant told about the business's capital. She said that

"The price of cloth is determined by cooperative. I have a difficulty to get the business capital, because I may not borrow from the bank." (I3)

"As for the obstacles in weaving if someone dies weaving activity takes up to 7 days, besides that at night it is also prohibited to weave." (I3)

Related to the sale of woven fabrics, it is explained that the sale is done through cooperatives. This was confirmed by informant 4, who said that

"Sales of woven fabrics, initially through JMM / cooperatives. Now the woven fabric can be sold alone, and is visited by the buyer. Until now there is no on-line system, because there are signal constraints. Weavers already have a group called "pheasants", so there is a price equation to suppress competition." (I2)

The men role in obtaining raw materials and marketing is available. Weaving tools made by the role of traditional institutions in supporting the woven fabric industry are still lacking.

"There is a customary leader at the village level, village level. But it doesn't play a role. Sintang is often a champion, but not because of the role of the institution, but rather the role of individuals." (I4, i5)

Innovation in developing designs / motifs of woven fabrics is still weak.

"Difficult to develop a motive because it is less desirable. Buyers buy based on color quality." (I6, I7)

To support the successful development of woven fabrics and tourism in the Long House, it cannot be separated from the role of the government. The role of government is explained by informant 7. He explained that

"The role of the government in developing the production of ikat, according to the Head of the Tourism Office includes coordination and facilitating activities. The government provides motivation to the weaver community. There was a meeting with sub-district officials, to discuss the ikat industry. Village business institution bought woven cloth, but it was limited. There was empowering program assistance; community economic empowerment program; from the center, and there is an exhibition program that is all supported by the government. "(I7)

Strategy

The results of the strategy analysis show that the people of Ensaid Panjang Village have strengths: a weaving group working together; the seriousness of the community in maintaining customs; the existence of Betang houses and preserved cultural systems. The weaknesses of Ensaid Panjang Village people are that they are less innovative; the role of tribal institutions is lacking; and there is no tourism aware group that can develop woven fabric products. Opportunities include increasing the number of tourists and the role of government. The threat is competition in the woven fabric industry and technological developments (Table 1).

Table 1. Strengths, weaknesses, opportunities and threats

Internal factor	External factor
Strengths A group of weavers working together seriousness of the community in maintaining customs The existence of Betang houses and preserved cultural systems	Opportunity An increase in the number of tourists The role of government
Weakness Less innovative The role of tribal institutions is lacking Natural dyes was abandoned There is no tourism aware group that can develop Weak marketing of woven cloth products	Threat Competition in the woven fabric industry Technological development

The proposed strategies are: a) Guidance for innovating and diversifying woven fabric products to make accessories, caps, jackets, etc. ; b) It is necessary to increase the role of traditional institutions to better support the ikat industry through fostering and establishing cooperation; c) Establishment of a tourism awareness group that can develop marketing of woven fabric products that is realized in the village regulation; d) Efforts to determine forest areas for the preservation of natural coloring plants.

Previous research shows that natural beauty, some cultural objects and attractions were grouped as strengths, while access, accommodation and promotion were considered as weaknesses. Opportunities in developing tourism in Ensaid Panjang Village are hospitality and community participation in managing local culture. In this concern effort to lift up the tourism in this village must take into account the local potential including cloth woven [1]. for that we need an effort to increase community involvement and development. Tourism development that involves community participation is a process that must be carried out appear and appear by the community and improve community prosperity [4,5]. promotion is one of the determinants tourism success. Promotion becomes important factor for introducing various attractions tourists [6], especially in rural destinations which is far from the city. Various tourist attractions can be promoted as such as a local festival [7], food [8], including superior products such as woven fabrics.

IV. CONCLUSION

1. In making woven fabric there is no difficulty in obtaining raw materials and sales, however in terms of marketing and the fabric design process it is still lacking in innovation
2. For this reason strategies need to be developed include a) Guidance for innovating and diversifying woven fabric products to make accessories, caps, jackets, etc.; b) It is necessary to increase the role of traditional institutions

to better support the ikat industry through fostering and establishing cooperation; c) Establishment of a tourism awareness group that can develop marketing of woven fabric products that is realized in the village regulation; d) Efforts to determine forest areas for the preservation of natural coloring plants.

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The Effects of Micronutrient Intervention on Anemia, Fitness, and Work Productivity on Female Tea Pickers

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Abstract- The prevalence of iron deficiency worldwide is 30%, in developing countries it lies between 40-45%, whereas in developed countries it is 10% (Usfar et al. 2012). Based on the research of Riskesdas 2018, it is known that the prevalence of anemia in pregnant women is 48.9% with the most age having anemia lies between 15-24 years old (84.6%). This research aims to determine the effect of micronutrient interventions on anemia, fitness, and work productivity on tea picking women in the region Pangalengan Bandung, West Java. The method of research was experimental with 60 women of childbearing age (in Indonesia known as the so-called WUS, it stands for Wanita Usia Subur) as subjects, aged between 18-45 years old who were married and not pregnant. They were chosen purposively in the plantations Kebun Purbasari, Talun Santosa and Sedep. Subjects were divided into three groups namely: Intervention 1 (commercial micronutrients), Intervention 2 (vitamin B12-Folic Acid), and Control. This research is part of the studies funded by the Neys-van Hoogstraten Foundation (NHF). The data obtained from this research are the monitoring cards for supplement compliance, the hemoglobin status, the productivity (results of tea picking), and the physical fitness. The results showed that the level of adherence to micronutrients consumption was high, although there were still women whose adherence was lacking. Vitamin B12-Folic Acid supplement can increase the hemoglobin value. The physical fitness (VO₂ max) of the subjects before and after the intervention was relatively similar. A significant difference (p <0.01) on subject productivity was identified, where the highest productivity was found in supplement vitamin B12-Folic Acid.

Index Term- anemia, fitness, micronutrient, productivity, WUS.

I. INTRODUCTION

Anemia has been known as a public health problem for many years, but the decrease in its prevalence is still very low [1]. The group that is prone to anemia is the female workers due to lack of nutrition and also due to menstruation experienced by WUS every month. These affect the hemoglobin level and productivity on those workers [2]. Based on the results of research Riskesdas 2018 it is known that the prevalence of anemia in pregnant women is 48.9% with the most age having anemia lies between 15-24 years old (84.6%) [3]. Iron deficiency anemia is a form of anemia arising following a reduced supply of iron for erythropoiesis, due to empty iron storage which ultimately leads to a degraded formation of the hemoglobin [4]. This form of anemia is often found in the world, especially in developing countries due to limited economic capacity, low consumption of animal protein, and parasitic investment which is an endemic problem [5]. Iron is needed for the formation of hemoglobin which plays a role in oxygen storage and its transportation. Some enzymes that play a role in oxidative metabolism, DNA synthesis, neurotransmitters and catabolism also require the ions iron [6].

Iron deficiency anemia almost always occurs secondary to the underlying disease, so the recovery of the underlying disease becomes an important part of the medical treatment. The treatment principles of iron deficiency anemia are first to know the causes, second to overcome them and third to provide replacement therapy by iron preparations [7]. About 80-85% of the causes of iron deficiency anemia can be identified so that the treatment can be carried out appropriately [8]. In addition to iron nutrition anemia there is also megaloblastic anemia which is an irritation caused by impaired DNA synthesis and characterized by megaloblastic cells. The cells that are first affected are those that have relatively rapid changing properties, especially the early hematopoietic cells and the gastrointestinal epithelium. The cell division occurs slowly, but cytoplasmic development is normal, so megaloblastic cells tend to become large with an increase of the ratio RNA to DNA. Preceding cells of megaloblastic erythroid tend to be destroyed in the bone marrow [9]. Thus bone marrow cellularity often increases but the production of red blood cells decreases, and this abnormal condition is referred to as an ineffective erythropoiesis. Most megaloblastic anemia is caused due to deficiency of vitamin B12 (cobalamin) and / or folic acid [10]. Based on research conducted by Indriani (2013) the highest percentage of the Hb and Ht increase on anemic WUS workers is in the iron-folate intervention of 17% and 13%, and then in the MVM (Multi Vitamin Mineral) intervention group of 15% and 12% [11] This shows that anemia is caused not only by the iron deficiency, but there are also some other things.

Organic acids such as vitamin C greatly help the absorption of non-heme iron by changing the ferric form into ferrous form [12]. This form of ferro is more easily absorbed by the body. In addition, vitamin C forms ascorbate iron groups which remain soluble at higher pH in the duodenum. Therefore it is highly

recommended to eat food sources of vitamin C at every meal. In addition to vitamin C, ingredients such as citrate, malate, lactate, succinate can also facilitate iron absorption under certain conditions [13]. The intervention of folic acid and vitamin B12 will increase the hemoglobin levels so that it will improve anemia condition of the human being [14, 15].

Folic acid deficiency provides a clinical picture of megaloblastic anemia in the bone marrow and macrocytic in peripheral blood, accompanied by leucopenia. This clinical picture is based on irritation of the amino acid metabolism and inhibition of the protein synthesis. Folic acid deficiency may occur primary or secondary, namely impaired absorption in the gastrointestinal duct. Consuming folic acid in combination with vitamin B12 can improve the anemia status to become better [16].

The recommended frequency of supplement consumption for non-pregnant WUS is one per week, and during menstruation one per day. Assuming the menstruation period of a WUS worker lasts 4-8 days, thus in one month she must take 8-12 capsules / supplement pills. The consumption of micronutrients in this research is to improve the iron status for WUS workers having the marginal hemoglobin levels. In addition, this intervention treatment can hopefully improve the physical fitness and the productivity of WUS workers.

II. MATERIALS AND METHODS

This research was conducted in several tea plantations in the region Pengalengan - Bandung, West Java, covering the plantations Kebun Purbasari, Talun Santosa and Sedep. The method of this research is quasi-experimental by measuring the variables during pre-Intervention and post-Intervention. The *Intervention 1* provides micronutrients (commercial multivitamin minerals) containing ferrous gluconate (250 mg); manganese sulphate (0.2 mg); cooper sulphate (0.2 mg); folic acid (1.0 mcg); vitamin B12 (7.5 mcg); vitamin C (50 mg); and sorbitol (25 mg). The *Intervention 2* provides the intervention of vitamin B12-Folic Acid with vitamin B12 content of 0.2 mcg and folic acid of 150 mcg. This research is part of the researches funded by Neys-van Hoogstraten Foundation (NHF-Netherlands) and it has obtained the ethical approval from the Health Research Ethics Commission, Faculty of Public Health, Diponegoro University (Reference number: 22/EC/FKM/2015).

In this research, forty women of childbearing age (in Indonesian term WUS) were used as the test subjects for the intervention. They were divided into two groups called group *Intervention 1* (consisting of twenty women) and group *Intervention 2* (it consists also of twenty women). Both *Intervention* groups have the marginal hemoglobin levels (80-125 g/l). In addition to being married and having marginal hemoglobin levels, these WUS workers who fulfill the criteria for eligibility to be involved in this research are those women who are not sick, not pregnant, do not drink alcohol, do not smoke and they are willing to become participant of this research by filling out and signing the informed consent letter. The criteria for marginal hemoglobin levels used in this research are those having moderate anemia (Hb levels 80-99 g/l), light anemia (Hb levels 100-119 g/l) and those without anemia but having hemoglobin levels of the lower threshold (Hb levels 120-125 g/l). The women having the hemoglobin levels of the lower threshold still need nutrition treatment through prevention. Besides the *Intervention* groups, there was also one group called *Control* consisting of twenty women who do not suffer from anemia.

Consumption of micronutrients for *Intervention 1* is twice a week for the period of four months, whereas for *Intervention 2* the micronutrients are given every day for the same period of four months. To monitor the discipline of the subjects involved in the intervention, a card must be filled out every time they drink the micronutrients. The productivity of the subjects is determined through the quantity of the tea leaves they have picked (in kg) per week, the calculation of this productivity is supervised by the head of the plantation. The measurement of the physical fitness data is carried out using the *Queen's College Step Test* method which is a simple method as it does not require high costs, and it is easy to do. This method uses a bench of a height 16 inches (or 41.28 cm), the subject shall then jump up and down the bench for three minutes continuously with the rhythm 22 beats per minute controlled by a metronome. This test method is designed to measure cardiovascular endurance.

The obtained data is then entered into data base and further cleaned up to ensure the completeness. After completion of the cleaning up process, the data processing could then be started. The t-test analysis and ANOVA were used to identify differences of the outcome variables. Data processing and analysis used the computer program *Microsoft Excel* and *SPSS for Windows*.

III. RESULTS

The Table 1 shows the data for conformity with supplement consumption and for attendance of the subject. The level of conformity was very high, for the *Intervention 1* it lied at 94.1%, whereas for *Intervention 2* at 94.6%. The conformity level of 100% for the *Intervention 1* is achieved if the number of tablets taken is 36 tablets. For the *Intervention 2* the conformity level is counted as 100% if 122 tablets were taken. On average, the attendance of the subject per month during the intervention was 23.4 days for the *Intervention 1* and also 23.4 days for the *Intervention 2*.

Table 1. Conformity with Supplement Consumption and Attendance of the subject on work days

Variables	Intervention 1	Intervention 2
Conformity (%)		

Average±SD	94.1±13.5	94.6±6.6
Attendance (days/month)		
Average ±SD	23.4±2.2	23.4±2.4

The percentage of subjects determined based on the hemoglobin level (see Table 2) before and after *Intervention 1* showed a slight increase for the subjects without anemia from 0% (n = 0) (baseline) to 5% (n = 1) (endline), and for subjects with anemia the percentage has decreased from 100% (n = 20) to 95% (n = 19). The percentage before and after *Intervention 2* has increased for the subjects without anemia from 0% (n = 0) (baseline) to 35% (n = 7) (endline), and it has decreased for subjects with anemia from 100% (n = 20) to 65% (n = 13).

Table 2. The percentage of subjects (based on Hb levels) before and after Intervention

Anemia Status	Intervention 1				Intervention 2				Control			
	Baseline		Endline		Baseline		Endline		Baseline		Endline	
	n	%	n	%	n	%	n	%	n	%	n	%
Non-Anemia	0	0.0	1	5.0	0	0.0	7	35.0	20	100.0	20	100.0
Anemia	20	100.0	19	95.0	20	100.0	13	65.0	0	0.0	0	0.0
Total	20	100.0	20	100.0	20	100.0	20	100.0	20	100.0	20	100.0
Average	11.2±0.6		11.6±0.6		11.1±0.8		12.0±0.5		13.1±0.7		13.2±0.7	
Hb (g/dl)												
p ¹⁾	0.001				0.000				0.983			
Delta±SD	0.5±0.5 ^{ab}				0.9±0.0 ^a				0.0±1.1 ^b			
p ²⁾					0.003							

¹⁾paired t-test ²⁾ANOVA test

The results of *Intervention 1* showed an increase in Hb level from 11.2 g/dl (baseline) to 11.6 g/dl (endline), likewise also in *Intervention 2* the Hemoglobin level has increased from 11.1 g/dl to 12.0 g/dl. The t-test showed that in both intervention groups the Hb level at the endline was significantly higher than the level at the baseline. The ANOVA test results showed that there was a difference in Hb delta between *Intervention 1*, *Intervention 2*, and *Control* (p = 0.003).

The physical fitness data (VO₂ max) of the subjects are shown in Table 3. For *Intervention 1* the value VO₂ max decreased from 61.8 ± 0.8 (Baseline) to 60.5 ± 0.7 (Endline). For *Intervention 2* the value VO₂ max also decreased from 61.8 ± 0.6 (Baseline) to 60.9 ± 0.7 (Endline). The t-test results showed that VO₂ max at Baseline was higher than at Endline (p = 0.000).

Table 3. The physical fitness data (VO₂ max) of the subjects before and after Intervention

VO ₂ Max	Intervention 1		Intervention 2		Control	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Mean±SD	61.8±0.8	60.5±0.7	61.8±0.6	60.9±0.7	62.5±0.3	61.6±0.6
p ¹⁾	0.000		0.000		0.000	

¹⁾paired t-test

The Table 4 shows the distribution of subjects according to productivity before and after the intervention for both groups *Intervention* and group *Control*. The average value of the productivity before and after the intervention for group *Control* was 62.6 ± 16.8 kg of tea / day and 66.6 ± 17.7 kg of tea / day. The results of the group *Intervention 1* showed an increase in productivity from 69.6 kg of tea / day (baseline) to 74.1 kg of tea / day (endline). Similarly, the *Intervention 2* experienced an increase in productivity from 72.4 kg of tea / day to 85.6 kg of tea / day. The t-test showed that the productivity at the endline was greater than at the baseline (p = 0.000). The ANOVA test results showed that *Intervention 2* increased the productivity higher than *Intervention 1* and *Control* (p = 0.000).

Table 4. Subject productivity (kg/day) before and after Intervention

Productivity	Intervention 1		Intervention 2		Control	
	Baseline	Endline	Baseline	Endline	Baseline	Endline
Average±SD	69.6±22.9	74.1±23.0	72.4±18.8	85.6±18.1	62.6±16.8	66.6±17.7
p ¹⁾	0.000		0.000		0.002	
Delta	4.5±4.7 ^a		13.2±5.8 ^b		4.0±5.0 ^a	
p ²⁾			0.000			

IV. DISCUSSION

One of the factors influencing the success of supplementation is the conformity in consuming the supplements. If the level of conformity is high, the effect will then be more meaningful. The level of conformity in consuming the supplements for both groups *Intervention* is relatively high, although there are still some subjects whose conformity is lacking. The reason for the lack of conformity is forgetfulness, not feeling well, and so on. Aside from level of conformity, the attendance is also very important, and this is influenced by his health. Subjects who are sick or unwell will potentially be absent from work for health reasons. The absence can also be influenced by other things such as death, marriage, circumcision and other social events.

The results of this research showed consistency with those researches conducted by Daasgupta *et al.* (2016). It showed that anemia suffered by WUS will affect their health so that in turn will effect their productivity and their attendance which is lower compared to WUS having no anemia [17]. Therefore it is necessary to increase the food consumption patterns to being rich in Fe which later on will help improve its iron status, according to Ghose *et al.* (2016), the more consumption of the iron intake, the more improved the iron status of WUS having anemia will be [18]. Indriani *et al.* (2013) found that the anemia level of WUS workers was quite high, so iron supplement was needed to improve their iron status [19]. Consumption of ferrous supplements is a must for WUS workers, because they are not able to increase their Hemoglobin level if they only rely on food.

This research showed an improvement on the Hemoglobin levels in each *Intervention* group, through the combined consumption of iron and multivitamin mineral, and through the consumption of the B12 folate as well, thus in line with Muwakhidah's research in 2009 which showed an increase of the Hemoglobin levels. Referring to the research carried out by Mulyawati that the Hemoglobin level is increased after consumption of the iron supplements, this phenomenon of increased Hemoglobin level has also been found in the group for that the B12 and folic acid was given. Consuming the supplement interventions will increase the metabolism, subsequently the cell function will become better and be more optimal which in turn leads to a better food absorption, thus it will increase the appetite, and consequently it can increase the body weight. The results of Sahana *et al.* (2015) showed that consumption of iron folate can increase the Hemoglobin levels, Body Mass Index, work productivity and concentration [20]. The results of this research are consistent with those made by Ahmed in Bangladesh, namely consuming iron, folic acid and vitamins will increase the Hemoglobin level by 1.22 g/dL. This result is in line with other studies that showed the Hemoglobin levels of 3.28 g/dL after consumption of iron and B12. This is consistent with the theory that consuming the iron supplement will improve the process oxygenation in the cells, increase metabolism, and the cell function will be optimal, thus at the end the food absorption becomes better [21].

The results of this research are in line with the study performed by Makurat *et al.* (2014) which showed a positive effect between iron consumption and Hemoglobin levels on the working women and have a strong correlation [22]. In addition, it is proven that the lower the iron consumption, the lower the Hemoglobin level, so that there are still many working women suffering from anemia due to little consumption of the iron. This is consistent with the study made by Maesaroh (2007) which showed that 81.2% of women have low level of iron consumption and low level of hemoglobin as well, they are suffering from anemia that confirms a significant influence between iron consumption and the appearance of anemia [23]. The research of Anggraeni (2014) found the outcomes that there was a positive relationship between iron consumption and the appearance of anemia on the women living in the region Kendal [24]. Similarly, according to Coad and Pedley, the main factor causing anemia is lack of iron consumption, with approximately two-thirds of the body's iron are present in the red blood cells hemoglobin [25]. According to Gibson (2005) iron consumption plays an important role in the formation of hemoglobin [26]. If the hemoglobin level is low, it can reduce the work productivity and decrease the physical stamina that later on can make the body more prone against infection.

This research demonstrated the *Intervention 2* as the most influencing treatment, it has happened because the folic acid is needed for the formation of the red blood cells in the bone marrow, whereas the B12 is needed to convert the folate into an active form and in abnormal functioning of the metabolism of all cells especially the cells of the digestive ducts, bone marrow and neural networks (almatsier). More influences on the B12 folate intervention had been identified compared to iron intervention, possibly due to the anemia driven by deficiency on vitamin B12 and folic acid (B9). The significant relationship between vitamin B12 consumption and Hemoglobin level identified in this research is in line with the role of the vitamin B12 to function in the Hemoglobin synthesis and red blood cells through metabolism of fat, protein, and folic acid. The Vitamin B12 also acts as a cofactor in the formation of energy from protein and fat through the succinyl-CoA formation that is needed in Hemoglobin synthesis. The results of another study conducted by Indriani (2011) showed that the iron folate supplement in WUS workers having marginal Hemoglobin level could significantly increase Hemoglobin level by 8%, whereas the multivitamin minerals could indeed increase the hemoglobin level by 6% [27].

The results of Oppusunggu's research (2009) stated that iron consumption for the duration of three months successfully increased the hemoglobin level by 2.14 g/dL and it is followed by an increase in work productivity by 16.28%, the relationship between increased hemoglobin levels and work productivity showed a significant result ($p < 0.05$) [28]. Another study conducted by Permaesih *et al.* (2011) showed that the combined supplement of micronutrients and iron can increase the hemoglobin level even higher compared to groups that only obtain the iron supplement alone, additionally the combined supplementation of vitamins and iron can give a positive effect on changes in transferrin levels as an indicator of iron status [29]. Changes in hemoglobin levels are not only influenced by multivitamin supplement, they are also influenced by other supplements which play a role in the formation of hemoglobin and inhibitors.

Based on the physical fitness test results, the workers who are the subject of this research are used to walk daily, even on inclined paths and they are not doing light activities such as carrying the load of the picked tea leaves. It can be seen from the Table 4 that the results of the physical fitness test before and after the intervention are relative the same. Although the factor activity does affect the fitness, in this research the daily activity patterns are assumed to be relatively similar between the subject groups because their daily tasks are the same, particularly when they are working in the plantations. This is in line with other

studies that demonstrated the benefits of iron supplement on physical activity (VO_2 max) of the childbearing age women [30, 31]. In these studies the level of physical fitness of the subject has also been evaluated through a method bench jump up and down.

The physical fitness tests are strongly influenced by the ability and endurance of the muscles. According to Whitney and Rofles (2008), the training for muscle strength and endurance will strengthen the muscles so that the body will not get tired quickly [32]. The muscle strength belong to the basic components of the body fitness as they are used to carry out daily activities. The more exercises are made for muscle strength and endurance, the more trained the muscles will be. The factors physical activity, intensity, duration and exercises categorized as routine can increase the adaptation (in term of endurance and strength) of human being to various types of activities or exercises. This will allow the human being to do optimally activities and trainings in a relatively longer period of time until they feel tired. The standard used to determine the VO_2 max value of the subjects having anemia is reduced by 20% from the VO_2 max of normal people without anemia [33]. Research conducted by Neto *et al.* (2011) showed that adolescents having light activity level and owning a low VO_2 max value would be more at risk to become exposed to the metabolic syndrome [34]. Therefore, preventive action is needed by increasing the sport activities routinely. The results of the conducted research showed arelationship between micronutrient consumption and fitness, such if an appropriate micronutrient were given to someone, he/she will be more fit and healthy [35].

The tea picking productivity is measured from the number of tea leaves that are picked every day. The table 4 shows that the productivity is increased in the groups *Control* and *Interventions* (of Iron and Vitamin B12 folate). Statistical method showed a significant difference ($p < 0.01$) between productivity and intervention, where the intervention of vitamin B12 folate is identified as the most influencing one. Chan *et al.* (2016) presented the results of his research that the consumption orally of the vitamin B12 would reduce the symptoms of anemia because it boosts the metabolism in the body and it also plays a vital role in the red blood cell formation [36]. This folic acid is an important element in DNA synthesis in collaboration with vitamin B12 [37]. In addition, folate is also involved in the red blood cell formation. This is proven through research conducted by Haidar *et al.* (2010): If folate is deficient then the body may not be able to produce enough red blood cells [38]. The produced red blood cells are abnormally large in size and they have a shorter endurance compared to normal ones.

V. CONCLUSION

One of the factors influencing the success of supplement is the conformity in consuming the supplements. With a high level of conformity, the effect will be more meaningful. The conformity level of consumption in both groups *Interventions* is classified as high, apart from the conformity, the attendance is also very important, and this is influenced by his health. In group *Intervention 2* namely B12 and folic acid the hemoglobin level has increased compared to group *Intervention 1*. The physical fitness data VO_2 max of subjects from both *Interventions* were relatively similar. The productivity value for both *Interventions* has increased from 69.6 to 74.1; 72.4 to 85.6, so there is a significant difference ($p < 0.01$) between the productivity and kind of treatment, where the *Intervention 2* is found as the most influencing treatment.

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The Sociological and Cultural Factors for The Prevalence of Ilgal Trek to Republic of South Africa: The Case of Shone Town, Hadiya Zone, SNNPR, Ethiopia

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Abstract: *This article examines socio-cultural factors for the prevalence illegal migration to RSA. So, as to attain the intended objectives, both qualitative and quantitative method of data collection was used. The quantitative data was collected through questionnaires and interview schedule from 141 registered returnee and 175 HHMs respectively. A total of 316 respondents were participated during qualitative data collection. Furthermore, the qualitative data was collected through in-depth interview and FGD. The collected data were analyzed by SPSS version 20 that was presented in detail using frequency and percentages. Qualitative data obtained from in depth interview and FGD were analyzed through careful interpretation and content analysis. The findings of the study indicated that socio-cultural factors like: identified social network between migrants, the social value attached to migration to RSA, the role of religion migrants affiliated and surrounding communities on individual decision to migrate as a socio cultural factors which drive youth to migrate illegally to RSA. This study also investigated the process and system of migration from the place of origin to final destination. Based on the research findings, conclusion and recommendations were mentioned that would help to minimize the existing factors which motivate people to migrate illegal.*

Key words: *Scio-cultural factors, remittance, social network, HHs of migrants, returnees, transit countries, destination countries.*

INTRODUCTION

Migration is considered as the movement of people from one geographic region to another, which may be on temporary or permanent basis. The reasons for it vary from one person to another depending on the situation that brought about the decision [1] (Adewale, 2005).

Although it is difficult to calculate the number of migrants worldwide with precision, recent estimations suggest that globally one in seven people today are migrants: 232 million people are international migrants, or 3.2% of the world population, from this more than 50 million people are illegal migrants in the world over one fifth of all international migrants [2] (IOM,2013).

Countries in Africa tend to experience both inflows and outflows of illegal migrants, due to their geographical position. Sudan, Ethiopia, Eritrea, Libya, Egypt, Morocco and Tunisia are primarily countries of origin, which rely on labor out migration to Gulf States and Jordan, Italy, Spain and Republic of South Africa, [3] (ILO, 2012).

Regarding labor migration from Ethiopia to Republic of South Africa scholars tried to investigate the beginning of Ethiopian migration to RSA through historical events. Accordingly, Ethiopian migrates in small number to RSA during the military government because it is illegal to leave the country.

However the fall of military government in 1991 and the end of a partied in South Africa increases the movements of people from Ethiopia to RSA which is currently dominated by two ethnic groups namely Hadiya and Kambata [4].(Cherstoper, 2009).

Furthermore, study conducted by Asanke and Zerhahun [5] (2015) pointed out two important historical events which played vital role for the current flow of people from Ethiopia to Republic South Africa particularly from Hadiya and Kambata ethnic group .i.e. involvements of government officials from Hadiya ethnic groups during Ethiopian diplomatic mission in South Africa and the flight of large number of Ethiopian soldiers from aforementioned ethnic group to South Africa following the overthrown of derg regime in 1991. Accordingly, these two events opened the door for current flow of labor migration from Ethiopia to Republic of South Africa. In line with this, study conducted by Teshome [6] (2013) argued the Ethiopian Ambassador in South Africa for two consecutive years (2001-2002) from Hadiya ethnic group created job opportunities for some youth from his birth place during his diplomatic mission in

South Africa embassy. Following this they were returned to the place of origin and engaged in investment activities. Accordingly this dynamic change within short period of time motivated the remaining community decision to migrate to South Africa. This indicates the present labor migration from Ethiopia to Republic of South Africa has historical root cause.

Nowadays, a significant number of labor powers have been migrating from Hadiya Zone to RSA. According to the study conducted by Ethiopian Embassy in South Africa estimated that approximately 45,000 to 50,000 Ethiopians live in South Africa which is dominated by two ethnic groups from Southern region namely Hadiya and Kambata[3] (ILO, 2012).

Furthermore, there are various factors for people decision to migrate from the place of origin to new destination. The purpose of this study was to investigate the socio economic and cultural factors for the current flow of migrants from the Shone administrative town to RSA. The study area is highly experienced in labor migration to South Africa. Returnee from final destination and transit countries and household heads of migrants were the target population of this study. Returnees were selected as a unit of analysis in order to identify the motivating factors for illegal migration. Were as, household heads of migrants chosen as unit of analysis due to the significant role they play during decision to migrate.

The researcher, motivated to conduct this study for various reason of this, due to the illegal nature of the journey migrants from the study area encounter several challenges during travel to destination countries including, staying long time in prison, lack of basic needs violation of human right countries and death. Migrants were informed about this challenge before they start the journey. Despite this, decision to migrate was made by household heads of migrants or migrants itself. The focus of this study was on socio economic and cultural factors which motivate for decision to migrate illegally. As long as the researcher of this study observed, these factors were not rigorously studied by pervious researchers. This was the key rationale for conducting the study. Thus, in this study, the researcher investigated socio economic and cultural factors for the prevalence of illegal migration to RSA.

RESEARCH METHODOLOGY

In this study, mixed research approaches were used. The descriptive research method from quantitative research approach, especially cross-sectional design was employed. The quantitative research approach was used to utilize statistically specific data that was representative of the target population as a whole, and to make the research more objective, accurate and generalizable.

Beside this, questionnaire was used to collect the quantitative data. To use the advantages of both quantitative and qualitative data, employing the quantitative and qualitative research approach together were very preferable and powerful. Hence, the qualitative approach was used to obtain in-depth data about the research problem. Focus group discussion and key informants interview were used to collect the qualitative data.

This research employed mixed approach i.e. qualitative and quantitative research methodology in order to achieve intended objective. FGD and in-depth interview was used to collect data qualitatively. Quantitative data collected from interview schedule.

Focus Group Discussion

This tool was used to get an ample and timely data through an interactive mode of information exchange. This data collecting instrument is believed to be very important since it gives freedom for the discussants to express their ideas, opinions, views and understanding of the situation of the study area.

The participants of FGD were different from the sample taken to conduct interview schedule and questionnaires. Accordingly, unregistered returnees from RSA, and HHMs who were not included in interview schedule were participated in this study. The participants were selected through snow ball sampling technique. By using this technique of sample determination registered migrants' asked in order to identify those migrants' who were not registered when they returned to the place of origin within the year interval which taken as eligible criteria in this study. Accordingly, FGD discussants were in 2 groups and each of the groups had 6 discussants which mean there were a total of 12 discussants participated in this study.

The discussion was held in the proper place for FGD participants and for the discussion itself. Permission was obtained from Kebele administrator for a place to conduct focus group discussion. Finally, the researcher had moderated the discussion based on guiding questions in the Amharic language and all records were translated to English during the time of analyzing the data.

In-depth Interview

The main purpose of conducting in-depth interview in this study was to dig the detail information on the topic researched. The informants were returnee migrants' from Republic of South Africa to the place of origin and house hold heads of migrants.

In order to select returnee judgmental (purposive sampling) technique was employed. The researcher used this sampling technique due to prior information regarding unregistered returnees who were deported from transit countries to the place of origin particularly those who arrested in transit countries when they try to cross the border illegally during journey to Republic of South Africa.

Returnees who were assumed to be more experienced in shearing their life experience under the issues were selected purposively from the rest of unit of analysis. Accordingly, 6 in-depth- interview was held with returned migrants'. The above sampling technique was also used to select household heads of migrants for in-depth interview.

Muslim	1	0.7	4	2.2
Traditional religion (Fandano)	-	-	3	1.7
Total	141	100	175	100

Source; own survey, 2016

As indicated in table 1, respondents were asked to specify their socio cultural backgrounds. Accordingly, 73% of respondents were belong to Hadiya ethnic group followed by Kambataa ethnic group 15.6%, respondents who were from Wolayita ethnic group constituted 5.63%. The rest three ethnic group namely Amharaa, Aalaba, and Guraage constitute 5.65%.

The above data clearly indicates significant number of returnee to the place of origin from RSA were from Hadiya ethnic group, followed by kambataa. In line with this majority of household heads of migrants were from Hadaya ethnic group. It implies majority of illegal migrants from the study area to RSA were from Hadiya ethnic group.

It is known that Ethiopia is a country of more than 86 ethnic groups. But labor migration from Ethiopia to RSA were dominated by Hadiya and kambata ethnic groups. Since, the pioneers of this migration path were from the aforementioned two ethnic groups the current flows of people to RSA were primarily dominated by them.

According to reviewed literatures there are two historical root causes for the high number of migrants from this ethnic group's .i.e. the role of Ethiopian Ambassador in South Africa who created job opportunity for youth from his place of origin (Hadiya) during his stay in Ethiopian embassy which found in South Africa. Secondly, the flight of huge number of Ethiopian soldiers who were ethnically from this group to various African countries including South Africa following the fall of Derg regime. This two historical events identified as the reason for the current flow of people from Ethiopia to RSA.

As observed from table 1, (85.5%). respondents were affiliated to Protestants religion, followed by Orthodox (8.51). Respondents who were affiliated to Catholic religion were (4.96%). The lowest proportion of respondents (0.7%) were followers of Muslim religion.

Based on the data presented highest number of respondents were follow protestant religion at place of origin. This implies religion respondents were affiliated play significant role on decision to migrate which is discussed in Scio cultural factors motivates individual decision to migrate.

Regarding to sex of the household heads of migrants 86.8% were male headed household were as the remaining 13.2% of the respondents were female headed household. The data imply that the study community is highly male headed household.

Socio-cultural factors for labor migration to RSA

These parts of result and decision attempted to identify the socio cultural factors which motivate individual and family decision to go abroad .particularly the role of religion institutions, family relative and friends influence, social value attached to going abroad, and existed social networks between pervious migrants, aspirant migrants and non-migrants discussed based on the data collected.

Table 2 Returnees view on the role of religion they affiliated in their decisions to migrate

Variables	Categories	N	%
Assisted by religion affiliated	Yes	121	85.5
	No	20	14.2
Total		141	100

Variables	RRSA		DRJ		
	N	%	N	%	
Assistance provided	Financial support	7	5.8	14	12
	Prophesied the successful journey	16	13.3	23	19
	Pray for successful journey	22	18.2	39	32
Total	45	37.2	76	62.8	

*RRSA refers returnee from final destination (RSA) *DRJ refers deported returnee from journey

Source own survey, 2016

As shown in table 2, from the total 141 registered returnee with year interval between ,2013-2015, 85.5% of respondents were get assistance before starting the journey to RSA from religion they affiliated. Whereas, 14.2% of respondents were don not get any assistance from religion they affiliated at place of origin.

Assistance provided for RRSA observed in table, 2 , accordingly, 18.2% of respondents were assisted by pray for successful journey and safe travel to destination countries, 13.3% were assisted by the religion affiliated via Prophecy of successful journey. The remaining 5.8% of respondents were assisted by money at the initial stage of journey to RSA.

Regarding assistance provided for DRJ 32.2% of respondents were assisted by pray for successful journey, 19% of respondents were assisted by prophetic words about the journey, whereas, 11.6% of respondents were assisted by money intended to cover travel cost.

According to Scio-cultural survey data of the returnee majority of the respondents were protestant religion followers. Respondents who were affiliated to protestant religion have high propensity to get assistance during the process of migration rather than other religion followers. Furthermore it implies point out the existence of unsuccessful travel to destination countries whose migration had been prophesized to be successful.

In similar way in-depth informant interview informant from HHMs explained that as travel document are prepared and money is secured , they look to religious leaders to pray for their succeed and to interpret the will of God in the journey. Besides, in-depth interview informant explained prophesying the successful journey is common for the person who decided to migrate .There is a common saying among the community member “*Amen yuukenee afaa dawalakoo lamen yuukane laase dabaalakoo*”. In Amahric version to mean “አሜን ነጋሳ ለሰው ደረሰው ደውሎ ለምን ያሉ ነው ዳሳ ተመለሱ! ” meaning those who receive the prophesy without hesitating safely arrive to RSA, whereas those who do not certain about the prophesy return home before reaching RSA. In connection to this in-depth interview informant from household heads of migrants share the migration experiences of family member as follows:

.....First we prepared the travel documents like passport and transportation cost together with my son, we look to religious leaders to pray for my son success in the journey and infer the will of God .And God tells us the journey will be safe one on behalf of our spiritual father .Then my family member certain about the safe arrival of my son , we sent him thorough local broker as agent .But the long march from Ethiopia to RSA is difficult and often dangerous one .Death along the journey is common ,through this period my family member and religious leader continued to prayer meeting at home and formal church program time . After 25 days of journey my son safely arrived to RSA. Then we celebrated and worship God with religious leaders at home Immediately after 3 month he sent 5,000ETB to support the local church at place of origin and remind them to pray for him to be safe in RSA”.

The data indicates, religious institution at place of origin were playing pivotal role in deciding the future fate of migrants journey through spiritual belief and practices like pray and prophecy for successful journey .In connection to this (Finkeand Stark,1988) stated that religion makes claims about metaphysical elements and universal truths. Such claims, which concern interaction with this supernatural, are a powerful source and shaper of values and, consequently, a motivator for calculating social action).

The Role of Social Network on Individual Decision to Migrate

The social network operationally defends in this study as the link between migrants, non-migrants, returned migrants, and aspirant migrants both in sending and receiving country through bonds of kinship and sheared community at place origin. According to key informants interview with returnee the existed networks facilitate and encourage the process of migration by producing resources in the form of information and assistance to aspirant migrants. In line with this in depth interview informant at *arancha kefel ketema* explained his experiences as follows:

.....before I start the journey I contacted my childhood friend who live in dabube Africa in order to get adequate information about the journey process and the entire work condition in debube Africa .He give me sufficient information and decided to go. The information I got from my friend lowers the cost of my movement including direct money cost and I get expected benefit from debube Africa(returnee migrants from RSA) ‘.

This notion indicates. Previous migrants play significant role on individual’s decision to migrate to RSA from the place of origin. Furthermore, this study identified various ways of approaching the role of migrant’s networks in migration process. Accordingly the presence of relatives in RSA play significant role in influencing migration intention and actual migration behavior alike.

FGD discussants also argue that relatives who live in RSA motivate and direct migration by assuring the migrants aid or support in RSA. Accordingly, everyone in the community under claim some tie with RSA migrants through kinship, friendship, or shared community at place of origin. In connection, to this study conducted by Massey, *etal*(1990) argue that more migrants move to a particular place because that is where the networks lead, and because that is where the social structure affords them the greatest opportunities for success. As more migrants arrive, the range of social connections is further extended, making subsequent migration to that place even more likely.

Table 3 Household heads of migrants perceptions towards destination country

Variables	Response	N	%
Perception	Positive	127	72.57
	Negative	48	27.42

Total	175	100
Primary reason for positive perception		
Expectation of high remittance	64	36.6
Successful story of pervious migrants	85	48.5
Offer high social status in the community	20	11.4
Secured place for living	6	3.42
Total	175	100
Primary reason for negative perception		
Challenges migrants face during travel	25	14.28
Story of unsuccessful migrants	12	6.8
Frequent story of illegal migrant's death	3	1.7
Absence of freedom to move in RSA	8	4.5
Total	48	27.4

Source; own survey, 2017

As indicated in the table 3, from the total 175 household heads of migrants who participated in this study 127(72.57%) had positive perception for family member migrations to RSA, whereas 48(27.42%) of respondents were negatively perceived RSA as destination country towards their family member migration to RSA.

This implies the majority of the household heads of migrants positively perceived labor migration from the place origin to RSA this is due to the success story of pervious migrants from the study area .Returnees from RSA in the study area engaged in investment activates by the money they accumulated through hard working in RSA. For instance, they constructed hotels and deluxe house in town. Thus, household heads of migrants positively perceived family member migration to RSA. (See table 3).

Furthermore, in the study community, people positively perceive labor migration to RSA due to, expectation of high amount of remittance, it offers better social status and it is secured place for living (see table, 3).In line with this response from focus group decision and in-depth interview confirmed that expectation of high remittance by the household member and migrants itself pointed as reason for positive perception in the study area.

On the other hand, respondents who were negatively perceive destination country were presented in table 11, accordingly, from the total 175 participants of this study 48(27.42%)of respondents were negatively perceived destination country during their family member migration to RSA of this respondents 14.28% negatively perceived their family member migration to RSA due to prolonged and harsh condition of the journey, followed by 6.8% of the respondents who were negatively perceived destination country due to bad story of previously deported migrants to the place of origin before reaching the actual destination .The remaining 4.5% and 1.7 % of respondents negatively perceived destination country because of lack of security at destination and frequent story of death during journey on previous migrants.

Community Role on Individual Decision to Migrate

According to FGD, discussants' surrounding community play vital role on individual decision to migrate. Accordingly, the main scenario community member participation demonstrated on accompany program (የሽንገል ፕሮግራም). This social event used as one mechanism to cover transportation cost for aspire migrants. Aforementioned preprogram practiced through different ways which is intended to collect money for travel cost characterized by different ways preparing a pray ceremony for successful journey with very small amount of cost. The participants were invited, using invitation letters. The invited people may be relatives, friends, and people from religion they affiliated, government workers and others.

This indicates, the strong ties among the community members regarding the social issue and the support each other during the time of challenges. Moreover, it implies community member used as source in founding the travel cost for aspirant migrants.

In line with these findings, Messye (1993) argue that people should be more likely to migrate abroad if they come from a community where many people migrated or a large knowledge of migration is available.

Table 4 Assistances provided by pervious migrants'

Variables	Response	N	%
Do you get any assistance?	Yes	128	90.8
From pervious migrants'	No	13	9.2
Total		141	100
Assistance provided	To easily access <i>dalalaa</i> at place of origin	31	22
	Information about destination countries	57	40.4
	Promise to get job RSA	19	13.47

	Contributed money during travel	21	14.89
Total		128	90.8

Source, own survey, 2016

As indicated in the table 4 respondents were asked to answer whether they get assistance from previously migrated person or not. Accordingly, 90.8% of respondents get assistance during the time of migration from previous migrants'. Whereas, 9.2% of respondents were don't get any assistance from previous migrants which is constituted the lowest proportion when compared to the sample population.

The data indicates majority of the respondents' were assisted by previous migrants' during the process of migration. Besides, it implies the significant role of past migration on the current flow of labor from the study area. Previous migrants from the study area assist aspirant migrants in various ways as it is observed in the in table 12, 40.4% of the respondents were get valuable information regarding destination countries, followed by 22% of respondents who were assisted to easily access *dalaala* at place of origin. The remaining 14.89% and 13.87% of respondents promised by previous migrants' to get job in RSA and assisted in terms of money which required to cover travel cost respectively.

The data presented above clearly indicate that aspiring migrants' have high access to family, friends, and other previous migrants in RSA. This access to previous migrants' play significant role in diving individuals from the place of origin to new destination through the assistance they provide. In connection to this in-depth interview with returnee from *kanchara* kebele explained the assistance provided from previous migrants' in his own words as follows;

--- "I had a childhood friend in South Africa and he told me about his life and the money he earns. Listening to his success, I decided to go *dabube* Africa and asked him to contribute money in order to cover my travel cost. He accepted my request and sent some amount of money. Then I started the journey to South Africa due to the assistance provided from my friend.

Therefore, destination contacts with a person who had migrated earlier from the home area have a positive effect on deriving individual decision to migrate. In line with this findings (Faist 1997; Pries 2004) pointed out the role of earlier migrants' on individual decision to migrate in terms of social network. This network which is created between previous migrants' and aspiring migrants' help migrant's to finance their travel, to find a job or accommodation in final destination. Thus, earlier migrants' from the place of origin provide assistance for aspiring migrants' who decided to come RSA in terms of providing information, how to get *dalala* in the place of origin, finding job, and financing their travel.

Conclusion

The findings of this study revealed that illegal migration to RSA was mainly attributed to socio - cultural factors. Based on the research results and discussions made so far the following conclusions can be drawn:-

Based on socio-demographic data majority of migrants from the study community to RSA were male. Accordingly, age and marital status of the study community determine the decision to migrate

Migrants from the study community to RSA were mainly from Hadiya ethnic group who were the followers of protestant religion. In terms of occupation majority of migrants were students at place of origin who failed to succeed in educational endeavors.

Furthermore, there are also socio cultural factors in the study community which motivate the decision to migrate i.e. religion individuals affiliated, the social value attached to migration, , perception towards destination countries were identified as socio cultural factors which motivates people to migrate from the place of origin to Republic of south Africa.

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On fixed decomposition of non-deranged permutations

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Abstract- Permutation statistic is one of the interesting field in Mathematics. In this paper we compute and redefined some statistics with

respect to Γ_1 non deranged permutations, we also showed that the statistics *dez* (cardinality of the set *Dez*) is an Eulerian statistics on Γ_1 non deranged permutation due to its equidistributed with *des* (cardinality of the descent set) and the statistics *maz* (sum of the descent of *ZDer*) is equidistributed with *Maj* (sum of the descent set).

Index Terms- Descent Numbers; Descent set; Descent set of ZDer; non-deranged permutations

I. INTRODUCTION

Permutation statistics were first introduced by [3] and then extensively studied by [10] in the last decades much progress has made, both in the discovery and the study of new statistics, and in extending these to other type of permutations such as words and restricted permutation. The concept of derangements in permutation groups (that is permutations without a fix element) has proportion in the underlying symmetric group

S_n . Garba and Ibrahim [4] used the concept to develop a scheme for prime numbers $P \leq 5$ and $\Omega \subseteq N$ which generate the cycles of permutations (derangements) using

$$\omega_i = ((1)(1+i)_{mp} (1+2i)_{mp} \dots (1+(p-1)i)_{mp}) \text{ to}$$

determine the arrangements. It is difficult for a set of derangements to be a permutation group because of the absence of the natural identity element (a non derangement), The construction of the generated set of permutations from the work of [4] as a permutation group was done by [11]. They achieved this by embedding an identity element into the generated set of permutation (strictly derangements) with the natural permutation composition as the binary operation (the group was denoted as G_p)

With no doubt, patterns in permutations have been well studied for over a century. As seem to be the case, these patterns were studied on permutations arbitrary. The symmetric group S_n is the set of all permutations of a set Γ of cardinality n. There are several types of other smaller permutation groups (subgroup of

S_n) of set Γ , a notable one among them is the alternating group A_n . On the other hand, [6] studied the representation of Γ_1 -non deranged permutation group $G_p^{\Gamma_1}$ via group character, hence established that the character of every $\omega_i \in G_p^{\Gamma_1}$ is never zero.

Also the non standard Young tableaux of Γ_1 -non deranged permutation group $G_p^{\Gamma_1}$ has been studied by [5], they established that the Young tableaux of this permutation group is non standard. [1] studied pattern popularity in Γ_1 -non deranged permutations they establish algebraically that pattern τ_1 is the most popular and pattern τ_3, τ_4 and τ_5 are equipopular in $G_p^{\Gamma_1}$ they further provided efficient algorithms and some

results on popularity of patterns of length-3 in $G_p^{\Gamma_1}$. [2] studied Fuzzy on Γ_1 -non deranged permutation group $G_p^{\Gamma_1}$ and discover that it is a one sided fuzzy ideal (only right fuzzy but not left) also the α -level cut of f coincides with $G_p^{\Gamma_1}$ if

$\alpha = \frac{1}{p}$ [7] studied ascent on Γ_1 -non deranged permutation group $G_p^{\Gamma_1}$ and discover that the union of ascent of all Γ_1 -non derangement is equal to identity also observed that the difference between $Asc(\omega_i)$ and $Asc(\omega_{p-1})$ is one. [8] provide very

useful theoretical properties of Γ_1 -non deranged permutation s in relation to excedance and shown that the excedance set of all ω_i in $G_p^{\Gamma_1}$ such that $\omega_i \neq e$ is $\frac{1}{2}(p-1)$. More recently [9]

established that the intersection of descent set of all Γ_1 -non derangement is empty, also observed that the descent number is strictly less than ascent number by $p-1$. Hence we will in this paper show that the statistics *dez* (cardinality of the set *Dez*) is an Eulerian statistics on Γ_1 non deranged permutations and the

statistics maz (sum of the descent of $ZDer$) is equidistributed with Maj (sum of the descent set).

II. PRELIMINARIES

Definition 2.1 [2]

Let Γ be a non empty set of prime cardinality greater or equal to 5 such that $\Gamma \subset \square A$

bijection ω on Γ of the form

$$\omega_i = \begin{pmatrix} 1 & 2 & 3 & \dots & p \\ 1 & (1+i)_{mp} & (1+2i)_{mp} & \dots & (1+(p-1)i)_{mp} \end{pmatrix}$$

is called a Γ_1 -non deranged permutation. We denoted G_p to be the set of all Γ_1 -non deranged permutations.

Definition 2.2 [2]

The pair G_p and the natural permutation composition forms a group which is denoted as

$G_p^{\Gamma_1}$. This is a special permutation group which fixes the first element of Γ .

Definition 2.3 [9]

An descent of permutation

$$f = \begin{pmatrix} 1 & 2 & 3 & \dots & n \\ f(1) & f(2) & f(3) & \dots & f(n) \end{pmatrix}$$

is any positive $i > n$ (where i and n are positive integers) where the current value is greater than the next, that

is i is an descent of a permutation $f(i) > f(i+1)$. The descent set of f , denoted as

$Des(f)$, is given by $Des(f) = \{i : f(i) > f(i+1)\}$ the

descent number of f , denoted as $des(f)$, is defined as the number of descent and is given by $des(f) = |Des(f)|$.

Definition 2.4

$ZDer(f)$ is the permutation derived from f by replacing each fixed point $f(i)$ by 0 and each other value $f(j)$ with $i \neq j$

Definition 2.5

$Der(f)$ is the non zero permutation of $ZDer(f)$

Definition 2.6

The major index of f denoted by $maj(f)$ is the sum of the

$$maj(f) = \sum_{i \in Des(f)} i$$

descent set of the permutation f that is

III. MAIN RESULTS

Proposition 3.1.

Suppose that $G_p^{\Gamma_1}$ is Γ_1 -non deranged permutations. The

$$Dez(\omega_i) = Des(\omega_i)$$

Proof.

Since $\omega_i = \begin{pmatrix} 1(1+i)_{mp} & (1+2i)_{mp} & \dots & (1+(p-1)i)_{mp} \end{pmatrix}$
 and

$$red(\omega_i) = \begin{pmatrix} 2 & 3 & \dots & p \\ 1 & 2 & \dots & (p-1) \end{pmatrix}$$

suppose $\omega_i = a_1 a_2 \dots a_p$ and $red(\omega_i) = b_2 b_3 \dots b_p$. Since the permutation $ZDer(\omega_i)$ is the permutation derived from ω_i by replacing each fixed point a_i by 0 and each other value a_j with $i \neq j$, therefore since 1 is the only fixed point in ω_i then a_i in $ZDer(\omega_i)$ is zero. Therefore

$$ZDer(\omega_i) = \begin{pmatrix} 0 & i_{mp} & (2i)_{mp} & \dots & ((p-1)i)_{mp} \end{pmatrix}$$

Which is formed by subtracting 1 from each value in ω_i , ω_i , hence if $i < j$ in ω_i then $i < j$ in $ZDer(\omega_i)$

and if $a_i > a_j$ in ω_i then $a_i > a_j$ in $ZDer(\omega_i)$ the result follows

□

Corollary 3.2

Let $G_p^{\Gamma_1}$ be a Γ_1 -non derangement permutations, then the descent set of Zder is equidistributed with descent set

$$\sum_{i=1}^{p-1} dez(\omega_i) = \sum_{i=1}^{p-1} des(\omega_i)$$

Proof.

From proposition 3.1 the $Dez(\omega_i) = Des(\omega_i)$ and since $des(\omega_i)$ and $dez(\omega_i)$ are the cardinality of $Des(\omega_i)$ and $Dez(\omega_i)$ respectively. Then $dez(\omega_i) = des(\omega_i)$

Hence,

$$\sum_{i=1}^{p-1} dez(\omega_i) = \sum_{i=1}^{p-1} des(\omega_i)$$

Remark 3.3

We can conclude that since both the set and the cardinality of DES and DEZ are equal, then they have the same properties.

Proposition 3.4

Suppose that $G_p^{\Gamma_1}$ is Γ_1 -non deranged permutations. Then the sum of descent set of Zder is equidistributed with sum of descent set

$$\sum_{i=1}^{p-1} maz(\omega_i) = \sum_{i=1}^{p-1} maj(\omega_i)$$

Proof.

$$maz(\omega_i) = \sum_{i \in DEZ(\omega_i)} i.$$

The But it has been shown from proposition 3.1 that

$$Dez(\omega_i) = Des(\omega_i)$$

Hence

$$maz(\omega_i) = \sum_{i \in DES(\omega_i)} i.$$

by replacing $Dez(\omega_i)$ by $Des(\omega_i)$ and

$$maj(\omega_i) = \sum_{i \in DES(\omega_i)} i.$$

Therefore,

$$\sum_{i=1}^{p-1} maz(\omega_i) = \sum_{i=1}^{p-1} maj(\omega_i)$$

□

Remark 3.5

It is easy to notice that Maz and Maj of ω_i are equal since the descent set and the descent set of $ZDer$ which are Des and Dez are equal. And Maz is the major derived from Dez

Proposition 3.6

Let $G_P^{\Gamma_1}$ be a Γ_1 -non derangement permutations, then the

$$maf(\omega_i) = maj \circ Der(\omega_i)$$

Proof.

$$Maf(\pi) = \sum_{i \in Fix(\pi)} i - \sum_{i=1}^{Fix(\pi)} i + maj \circ Der(\pi)$$

The

Since for every $\omega_i \in G_P^{\Gamma_1}$ only 1 is fix then,

$$\sum_{i \in Fix(\pi)} i - \sum_{i=1}^{Fix(\pi)} i = 0.$$

Hence,

$$maf(\omega_i) = maj \circ Der(\omega_i)$$

□

Proposition 3.7

Suppose that $G_P^{\Gamma_1}$ is Γ_1 -non deranged permutations. Then

$$maf(\omega_i) = dez(\omega_i) \left(\frac{p-1}{2} \right)$$

Proof.

Since

$$ZDer(\omega_i) = (0 \ i_{mp} \ (2i)_{mp} \ \dots \ ((p-1)i)_{mp})$$

And

$$Der(\omega_i) = (i_{mp} \ (2i)_{mp} \ \dots \ ((p-1)i)_{mp})$$

$$maj \circ ZDer(\omega_i) = dez(\omega_i) \left(\frac{p-1}{2} \right)$$

but

Then since $Der(\omega_i)$ is formed by eliminating the first value (i.e 0) in $ZDer(\omega_i)$.

Therefore,

$$\begin{aligned} maj \circ Der(\omega_i) &= dez(\omega_i) \left(\frac{p+1}{2} \right) - 1 \\ &= dez(\omega_i) \left(\frac{p+1}{2} - 1 \right) \\ &= dez(\omega_i) \left(\frac{p-1}{2} \right) \end{aligned}$$

but

$$maf(\omega_i) = maj \circ Der(\omega_i)$$

Hence,

$$maf(\omega_i) = dez(\omega_i) \left(\frac{p-1}{2} \right)$$

□

Lemma 3.8

Let $G_P^{\Gamma_1}$ be a Γ_1 -non derangement permutations, then the

$$Dez(\omega_i) \cap Dez(\omega_{p-i}) = \phi$$

Proof.

Suppose $\omega_i = a_1 a_2 \dots a_{p-1} a_p$. Then since $Dez(\omega_i) = Des(\omega_i)$ so

$$Dez = \{i : i < j \ \& \ a_i > a_j\}$$

Also, $\omega_{p-i} = a_1 a_p a_{p-1} \dots a_2$, so its descent set

$Des = \{i : i < j \ \& \ a_i < a_j\}$. Therefore,

$$Dez(\omega_i) \cap Dez(\omega_{p-i}) = \emptyset$$

□

Proposition 3.9

Let $\omega_i \in G_p^{\Gamma_1}$. Then the

$$Dez(\omega_i) \cup Dez(\omega_{p-i}) = Dez(\omega_{p-1})$$

Proof.

Let $\omega_i = a_1 a_2 \dots a_{p-1} a_p$. Then the

$$Dez(\omega_i) = \{i : i < j \ \& \ a_i > a_j\}$$

Then since $\omega_{p-i} = a_1 a_p a_{p-1} \dots a_2$, its

$$Dez(\omega_i) = \{i : i < j \ \& \ a_i > a_j\} \text{ where } i \neq 1.$$

Therefore,

$$Dez(\omega_i) \cup Dez(\omega_{p-i}) = \{i : i < j \ \& \ a_i > a_j \text{ or } a_i < a_j, i \neq 1\}$$

Since ω_i is a permutation then

$$Dez(\omega_i) \cup Dez(\omega_{p-1}) = \{i : i < j, i \neq 1\}$$

Since $\omega_{p-1} = 1p(p-1)\dots 2$ then

$$Dez(\omega_{p-1}) = \{i : i < j, i \neq 1\}$$

Hence,

$$Dez(\omega_{p-1}) = Dez(\omega_i) \cup Dez(\omega_{p-i})$$

□

Corollary 3.10

Let $\omega_i \in G_p^{\Gamma_1}$. Then the

$$dez(\omega_i) + dez(\omega_{p-i}) = dez(\omega_{p-1})$$

Proof.

It follows from proposition 3.9

Corollary 3.11

Let $G_p^{\Gamma_1}$ be a Γ_1 -non derangement permutations, then the

$$Dez(\omega_{p-1}) = \bigcup_{i=1}^{p-2} Dez(\omega_i)$$

Proof.

From proposition 3.9 $Dez(\omega_i) \cup Dez(\omega_{p-i}) = Dez(\omega_{p-1})$,so

we want to show that for any $G_p^{\Gamma_1}$

there exist ω_i and ω_{p-1} where $i \neq 1$. Since $p \geq 5$ and any $G_p^{\Gamma_1}$

consist of non -deranged permutations $\{\omega_1, \omega_2, \dots, \omega_{p-1}\}$,

therefore it has atleast ω_2 and ω_{p-2} . The result follows.

IV. CONCLUSION

This paper has provided very useful theoretical properties of the statistics descent set and descent set of ZDer and the paper also shown that the statistics *dez* (cardinality of the set *Dez*) is an Eulerian statistics on Γ_1 non deranged permutations and the statistics *maz* (sum of the descent of *ZDer*) is equidistributed with *Maj* (sum of the descent set).

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Adultery Judgement and its impact in India

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Abstract- This paper tries to find the impact that the Adultery Judgement pronounced by the Honourable Supreme Court of India has been able to impact the people on the bond of marriage. For this, the judgement was analysed after which a questionnaire was made to a distinct set of age groups. Then the answers of the questionnaire were analysed, and a conclusion as to the final output of this analysis was created.

Index Terms- Adultery, Supreme Court of India, Section 497, Indian Penal Code

I. INTRODUCTION

The adultery judgement passed by the Supreme Court of India on 27th September 2018 has been one of the most controversial judgements passed in India in the past decade. The judgement brought the question of law and morality, and it had its fair share of approval and criticism throughout the country. The main idea of the case, the repelling of Section 497 of the Indian Penal Code, has gone through the phase of three previous judgements and has been dissected in our country, both from a social and legal stand.

Before we delve into the judgement and its impact in our nation, it is necessary to understand Section 497 of the IPC:

“Whoever has sexual intercourse with a person who is and whom he knows or has reason to believe to be the wife of another man, without the consent or connivance of that man, such sexual intercourse not amounting to the offence of rape, is guilty of the offence of adultery, and shall be punished with imprisonment of either description for a term which may extend to five years, or with fine, or with both. In such a case, the wife shall not be punishable as an abettor.”

From this definition, we can materialise that Adultery is an offence committed when a man has illicit sexual intercourse with another man’s wife without the consent of that man. With this brief introduction, we shall start our analysis.

II. BACKGROUND OF THE CASE

This judgement was delivered for the case *Joseph Shine Vs Union of India*, held in front of a five-judge bench of Supreme Court. This case was filed in August 2017 by Mr Joseph Shine, an Indian cum Italian businessman. In his affidavit, Mr Shine had stated the following remark:

"Married women are not a special case for the purpose of prosecution for adultery. They are not in any way situated differently than men,"

The birth of adultery was not through the English Common Law but was from the Bible. The Bible explicitly mentions that any man who enters into sexual intercourse with any other women after marriage is a sinner. Hence, in 1860, when the British Crown was ruling India, the Adultery Law was sanctioned as the British had taken the Bible’s principle in the Indian Penal Code.

This appeal had the magnanimity in its wordings of the affidavit to question the draconian law contained in Section 497 of Indian Penal Code which was questioned by the government. They stated that if this law were to be diluted, then it would destroy the sanctity in marriage but later when the judgement came out, they instead accepted.

III. STATEMENT OF THE PROBLEM:

We have chosen this topic because Section 497 had been in existence for 158 years and has been accepted by society. This stance has now changed dramatically. With Section 377 also being declared void, India is currently in a societal imbalance. Hence the authors felt that this would be the right time to find out the opinions of the people regarding this law and whether they are ready to accept it or not, even though the Supreme Court has stated that Adultery can be used as a ground for divorce, which seems to contradict its verdict as the court seems to accept Adultery as a moral wrong.

IV. OBJECTIVE

Our objective is to see whether the judiciary has been able to satisfy the specific needs of the common public of India through this judgement. In other words, the article is an attempt to check the compatibility of the judgement with our country and the impact it has created within its citizens.

V. SURVEY QUESTIONNAIRE

In order to get the opinions of the general public, we created a survey regarding the judgement. The survey was intended to reach out to individuals between the ages of 18-50. Sixty such

individuals have shared their opinions with us, anonymously, and we have used it to peruse our research. The survey contained seventeen questions, which has been mentioned below with its options:

Q1) Which age group do you belong to?

- A. 18-25
- B. 25-35
- C. 35-45
- D. 45-50

Q2) What is your gender?

- A. Male
- B. Female
- C. Other

Q3) What is your opinion on the judgement?

- A. I have a positive opinion
- B. I have a negative opinion
- C. I am not sure

Q4) How did you come to know about the judgement?

- A. Newspaper
- B. Television
- C. Social Media

Q5) Does this judgement promote gender equality?

- A. Yes
- B. No
- C. No opinion

Q6) What is your opinion about extramarital affair?

- A. It is the right of a person
- B. It is against moral values and ethics
- C. No opinion

Q7) Do you believe the judgement is in context with our country?

- A. Yes
- B. No
- C. No opinion

Q8) Do you support the judgement?

- A. Yes, it is a great change for our country
- B. No, the judgement undermines our culture
- C. I do not have an opinion

Q9) Do you think that adultery is more patriarchal in our country?

- A. Yes
- B. No
- C. Not sure

Q10) Do you think the divorce rate will increase after this judgement?

- A. Yes, it will increase
- B. No, the divorce rate will decrease
- C. No, the divorce rate will stabilise
- D. It does not affect the divorce rate

Q11) Will the judgement affect family relations?

- A. Yes
- B. No
- C. Maybe

Q12) Is cheating by personation a violation?

- A. Yes, it is a serious violation
- B. No, it is not a crime

Q13) Why only men? Is it a good idea to convict married women as well as for adultery?

- A. Yes
- B. No

Q14) Do you think that sexual privacy has been installed after this judgement?

- A. Yes, it has been installed.
- B. No, the judgement has not helped.
- C. No opinion

Q15) Do you believe that the rate of adultery will decrease after the judgement was passed?

- A. Yes, it will decrease
- B. No, it will increase
- C. No opinion

Q16) Does the judgement uphold the sanctity of marriage?

- A. Yes
- B. No

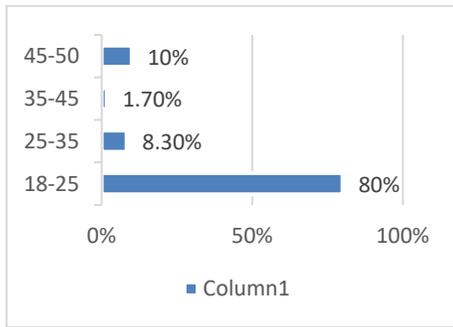
Q17) Since Adultery is no longer a crime, is it OK for it to be ground for divorce?

- A. Yes, it still is a violation of ethics and human morals.
- B. No, as it is not a crime anymore.

VI. ANALYSIS OF THE SURVEY

We have analysed the answers given by the sixty individuals in a summation for all the seventeen questions along with bar graphs for a better understanding.

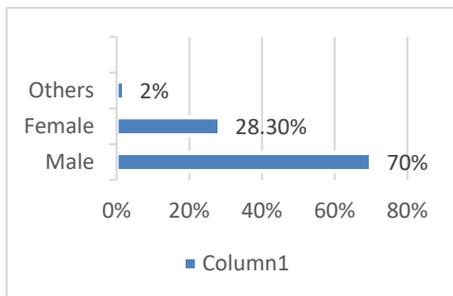
Q1) Which age group do you belong to?



- A. 18-25 (80%)
- B. 25-35 (8.3%)
- C. 35-45 (1.7%)
- D. 45-50 (10%)

Most of the participants of the survey were of the ages 18-25. This group accounts for 80% of the 60 individuals. The lowest number of participants were from the age group of 35-45, which accounted for a mere 1.7%, whereby the main objective of our project has been achieved through the responses.

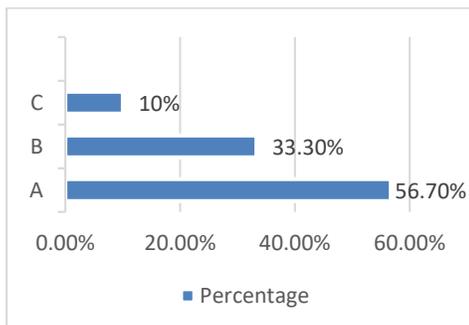
Q2) What is your gender?



- A. Male 70%
- B. Female 28.3%
- C. Others 2%

Most of our participant were men. They accounted for 70%. Women accounted for 28.3%, and others were 2%.

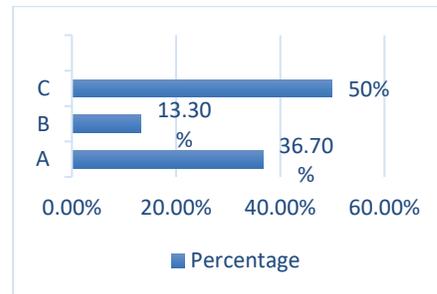
Q3) What is your opinion on the judgement?



- A. I have a positive opinion (56.7%)
- B. I have a negative opinion (33.3%)
- C. I'm not sure (10%)

The respondents mostly had a positive opinion regarding the judgement. 56.7% of the respondents stated that they were having a good opinion with the judgement, whereas 33.3% of the respondents had a negative opinion. However, we would like to point out the 10% who were not sure. This is the category which we were inferring previously. This group of people are not sure and are conflicted. They are not able to come up with a concise conclusion, mostly being influenced by social norms and ethical cultures.

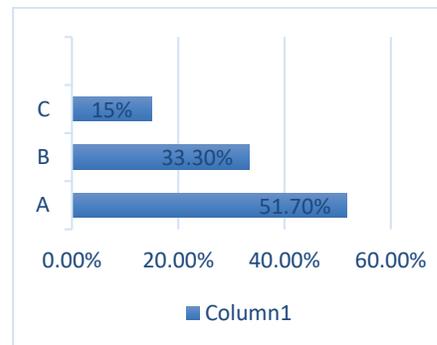
Q4) How did you come to know about the judgement?



- A. Newspaper (36.7%)
- B. Television (13.3%)
- C. Social Media (50%)

Most of the individuals had come to know about the judgement from social media. 50% of the 60 individuals, i.e. 30 individuals came to know about the judgement from the social media. This can be easily inferred, since 80% of the respondents were of the ages 18-25, and they are incredibly active in the social media front.

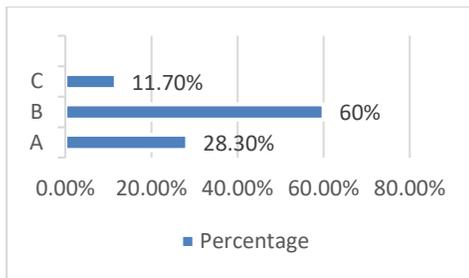
Q5) Does this judgement promote gender equality?



- A. Yes (51.7%)
- B. No (33.3%)
- C. No opinion (15%)

Gender Equality is one of the main questions raised by the judiciary when it came to Section 497. Hence it is an integral part of our survey. 51.7% agreed that the judgement promoted gender equality, whereas 33.3% opposed this view. However, 15% said that they had no opinion, which clearly states that they either did not want to answer the question or they were not aware of the nuances of the case.

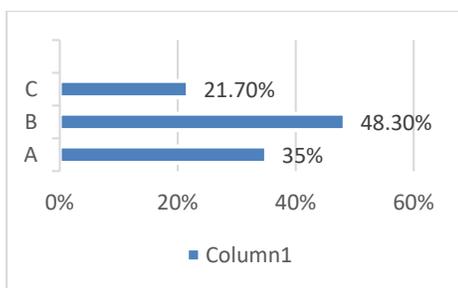
Q6) What is your opinion about extramarital affair?



- A. It is the right of a person (28.3%)
- B. It is against moral values and ethics (60%)
- C. No opinion (11.7%)

An extramarital affair is after all the main crux of the whole case. Whether it constitutes to adultery or not is the prime question. 28.3% of the individuals stated that it is the right of a person to choose. It is his free will. This set of individuals believe in the modernity of the society. They desire to break old social norms which, according to their understanding and belief, are not compatible with the 21st century. However, 60% of the individuals believe that extramarital affair is against moral values and ethics. Currently, society stands on this ground. Religious beliefs also play a vital role for these individuals. Another stand this group might take is that cheating on your life partner is a wound you are inflicting upon him/her. Hence it is wrong. 11.7% have stated that they have no opinion regarding extramarital affairs. This could imply that in the wake of the judgement, they are still unable to decide which is the correct choice for society as a whole.

Q7) Do you believe that the judgement is in context with our country?

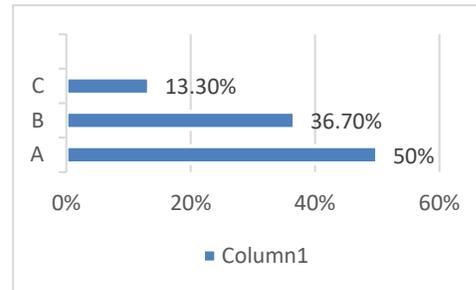


- A. Yes (35%)
- B. No (48.3%)
- C. No opinion (21.7%)

This is one of the most critical questions we framed for this survey as it is one of the reasons for this research. 35% said that the judgement is in context with our country. This group is ready for a change. The question being set for the current period, this group advocates immediate change. The 48.3% who said no either believe that this is not the time for such a judgement or they believe that the judgement itself is wrong. The complexity of the question assures that some individuals will have conflicting views and standpoints. Hence, we also received a group of individuals,

(21.7%), who were not sure whether India is ready for this judgement or not.

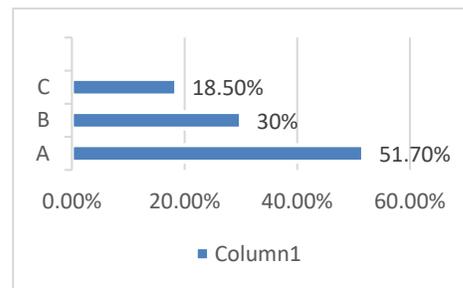
Q8) Do you support the judgement?



- A. Yes, it is a great change for our country (50%)
- B. No, the judgement undermines our culture (36.7%)
- C. I do not have an opinion (13.3%)

The participants of the survey mostly supported the judgement. 50% of the individuals agreed with the stance of the Supreme Court, whereas 36.7% disagreed. 13.3% were not sure whether or not to support the judgement.

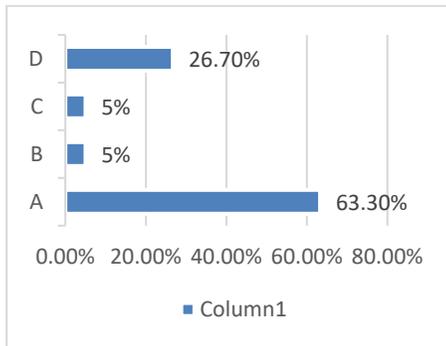
Q9) Do you think that adultery is more patriarchal in our country?



- A. Yes (51.7%)
- B. No (30%)
- C. Not sure (18.5%)

This is one of the questions which we thought that most people would not be able to answer as there is no specific proof for any of the answers. However, we received positive and negative answers. 51.7% of the individuals believe that men indulge more in extramarital affairs than women, whereas 30% of the individuals contradict this stand. Only 18.5% of the respondents were not sure. This could be the group which agrees upon the fact that there is no legitimate method to find a suitable answer for the question.

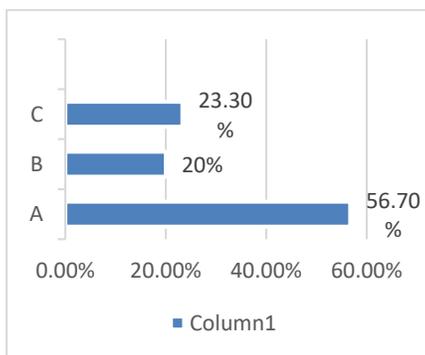
Q10) Do you think the divorce rate will increase after the judgement?



- A. Yes, it will increase (63.3%)
- B. No, the divorce rate will decrease (5%)
- C. No, the divorce rate will stabilise (5%)
- D. It does not affect the divorce rate (26.7%)

We raised this question as in the judgement, the Chief Justice of India, Hon'ble Mr Justice Dipak Misra mentioned that Adultery could be used as a ground for divorce. Hence, we wanted to know the public opinion. 63.3% of individuals believe that the divorce rate will increase. These individuals may be of the notion that since adultery is no longer a crime, it is bound to increase and therefore, the divorce rate will also increase. In total, 10% of the individuals believe that the divorce rate will not increase. Out of this 10%, 5% say that the divorce rate will decrease whereas the other 5% say that the divorce rate will stabilise. 26.7% of the individuals state that the judgement will not affect the divorce rate. This is an interesting standpoint as it could mean that people who want to indulge in an extramarital affair will do it anyway, whether it is a crime or not. Several judicial cases seem to prove this point like *Nanavati v. The State of Maharashtra, 1959*.

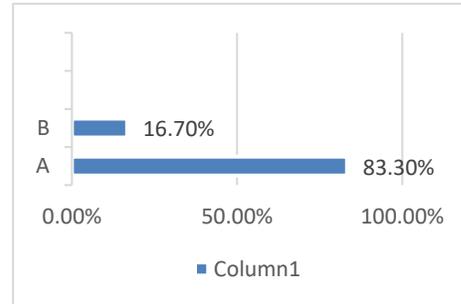
Q11) Will the judgement affect family relations?



- A. Yes (56.7%)
- B. No (20%)
- C. Maybe (23.3%)

This question was raised based on social and familial conditions. 56.7% of the individuals believe that the judgement will strain the familial relationships, whereas 20% do not believe so. However, 23.3% of the respondents believe that it may or may not strain the familial relations. It could mean that it is up to the people whether to allow the firm idea of the judgement to affect their relations with their family and loved ones.

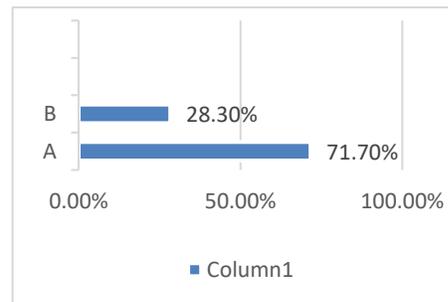
Q12) Is cheating by personation a violation?



- A. Yes, it is a serious violation (83.3%)
- B. No, it is not a crime (16.7%)

Cheating by personation means to act as another person and attempt to take advantage of the woman. Hence, 83.3% of the respondents believe that it is a violation of the woman's rights. Surprisingly, however, 16.7% believe that it is not a crime.

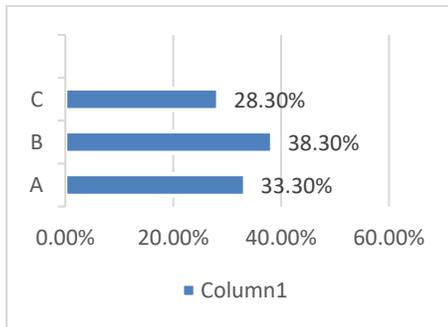
Q13) Why only men? Is it a good idea to convict married women as well for adultery?



- A. Yes (71.7%)
- B. No (28.3%)

The question raised was posed as an alternative solution to the problem of adultery. 71.7% of the individuals accepted this solution and believe that convicting women for the crime of adultery is a good idea, whereas 28.3% contradict this stand. This could mean that this set of individuals believe that adultery itself is not a crime, and hence, men and women alike should not be convicted for it.

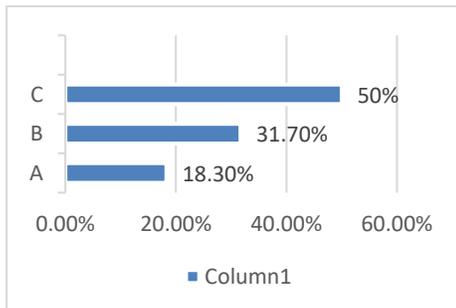
Q14) Do you think that sexual privacy has been installed after this judgement?



- A. Yes, it has been installed (33.3%)
- B. No. the judgement has not helped (38.3%)
- C. No Opinion (28.3%)

This is a question where we saw that all the answers were received in almost equal proportion. In this context, sexual privacy refers to the right of a person to choose with whom he has a sexual relationship. 33.3% of the individuals state that the judgement has helped achieve sexual privacy; 38.3% state that the judgement hasn't; 28.3% of the respondents don't have a conclusive opinion, which could mean that they don't see how the judgement affects the concept of sexual privacy.

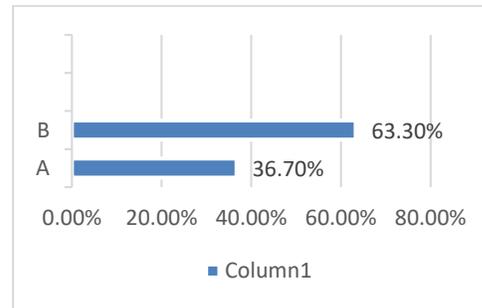
Q15) Do you believe that the rate of adultery will decrease after the judgement was passed?



- A. Yes, it will decrease (18.3%)
- B. No, it will increase (31.7%)
- C. No opinion (50%)

The determination of the rate of adultery, although technically not possible, can be averaged to a certain level. This is the reason for us to ask this question. The responses we received were, to a certain extent, divergent. 18.3% of the participants believe that the rate of adultery will decrease. It is possible that this group sees the optimistic points of the judgement and hence believe that women will be treated with more respect after the judgement. 31.7% of the respondents believe that the rate of adultery will increase. This set of individuals see the other aspect of the judgement. Since adultery is no longer a crime, they believe that people will be motivated to indulge in extramarital affairs. However, 50% of the individuals do not have an opinion, which could mean that they see both the aspects and are not sure which will precede first.

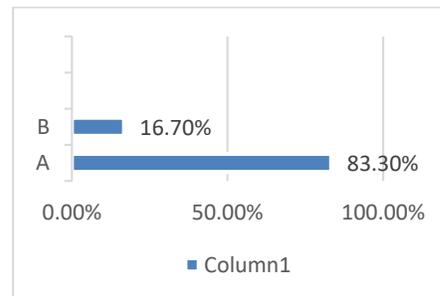
Q16) Does the judgement uphold the sanctity of marriage?



- A. Yes (36.7%)
- B. No (63.3%)

In India, marriages are considered as one of the most important events in a person's life. Hence, the significance of marriages in India is quite high. We considered this question to be one of the crucial questions of the survey. 36.7% of the individuals say that the judgement upholds the sanctity of marriage. This viewpoint can be taken on the following ground: Men and women are equals. They should respect each other and support each other equally in their marital life. Hence, the judgement upholds the value of a woman, thereby restoring her dignity. However, 63.3% of the participants believe that the judgement does not uphold the sanctity of marriage. Their stand could be that as Adultery is no longer a crime, it encourages people to indulge in extramarital affairs. This is in complete contradiction with the basic idea of marriage.

Q17) Since Adultery is no longer a crime, is it OK for it to be a ground for divorce?



- A. Yes, it still is a violation of ethics and human morals (83.3%)
- B. No, as it is not a crime anymore (16.7%)

This question was raised based on the statement given by the then Chief Justice of India, The Hon'ble Mr Justice Dipak Misra. 83.3% of the participants believe that it is a ground for divorce as it violated ethical and moral values. This group takes the factor of morality into account. They see the social aspect of the judgement. However, the other 16.7% believe that it should not be a ground for divorce as it is not a crime anymore. This is a technical and legal aspect that is being taken by this group of people.

VII. JUDICIAL ANALYSIS

A bench of five judges passed the judgement: The Hon'ble Chief Justice of India Mr Dipak Misra, The Hon'ble Mr Justice R. F. Nariman, The Hon'ble Mr Justice A. M. Khanwilkar, The

Hon'ble Dr Justice D. Y. Chandrachud and The Hon'ble Ms Justice Indu Malhotra. The judgement was unanimously passed by all five judges, thereby striking down Section 497.

One of the points raised by the Supreme Court is that Section 198 of IPC gives only the husband the right to file a case against the man involved in the act of adultery. Hence, this section merely reinforces the archaic thinking and sexual stereotyping that a woman belongs to a man, and a woman cannot have her thoughts and opinions.

This section also violates Article 14 and Article 15 of the Constitution of India. Article 14 of the Constitution says that "*The State shall not deny to any person equality before the law or the equal protection of the law within the territory of India.*" This implies that men and women are equal. Hence, going by this spirit, if the man involved in adultery is punished, then the woman should also be punished. Alternatively, if the woman involved in adultery is not punished, then the man should also not be punished. If the husband is given the right to file a case against the man who commits adultery with his wife, then the woman should also be given the right to file a case against a woman who commits adultery with her husband.

Article 15 of the Constitution states that "*The State shall not discriminate against any citizen on grounds merely of religion, race, caste, sex, place of birth, or any of them.*" Going by this spirit, Section 497 of IPC discriminates against men. The man involved in adultery is punished with five years of imprisonment, while the woman who involves in the act with full consent is set free because she cannot be considered as an abettor. Hence, by Article 15, if the man is punished, then the woman should also be punished. If the woman is set free, then the man should also be set free. If in case a man commits consensual sexual intercourse with a woman, with the consent of her husband is not considered as adultery, then it should also be the case when a woman commits consensual sexual intercourse with a man, with the consent of his wife, it would not amount to adultery.

If a married man who has consensual sexual intercourse with an unmarried woman is not committing adultery, then a married woman who has sexual intercourse with an unmarried man should also not be committing adultery.

The Supreme Court felt that laws should be gender-neutral. Hence, it pointed out that Section 497 of IPC merely makes a woman a victim and thus "creates a dent on the individual independent identity of the woman."

The judges have mentioned several critical points in the case. According to Chief Justice Dipak Misra and Justice Khanwalkar, the adultery law is manifestly arbitrary, and it creates a dent on the individuality of women. The judges also mentioned that the mere adultery law could not be considered as a crime. However, they agreed upon the fact that it can be a ground for divorce. Finally, to sum it up, the judges stated that a man having an extramarital relationship with a married woman is no longer a criminal offence.

Justice R. F. Nariman stated that the adultery law makes the man the seducer and the women being the victim and henceforth shall not exist. He further added that Section 497 of the Indian Penal Code is violative and hence should be squashed.

Justice D. Y. Chandrachud stated that Section 497 deprives a woman of autonomy and dignity. He also mentioned that Society attributes impossible attributes to a woman and that raising a woman to such a pedestal is one of such attributes. He severely criticised Section 497 as a woman loses her voice, autonomy after entering marriage and manifest arbitrariness is writ large in Section 497.

Finally, Justice Indu Malhotra stated that Section 497 forces women to live under the shadow of their husbands and hence should be disbanded. She also mentioned that the section institutionalises discrimination and hence should be abolished. She further added that a state could not interfere by punishing a man alone, which in itself is discrimination.

VIII. FINDINGS

[1] The analysis of the survey made it abundantly clear that the judgement is still young. People are yet to form their opinions regarding adultery.

[2] Being a social process, it is bound to take its course of time.

[3] However, the survey also shows us that the people who are clear with their opinions believe that this judgement is a positive addition to our nation.

[4] Most of the respondents were happy with the verdict passed by the Supreme Court of India and believe that women should not be treated as mere objects.

[5] They also agree that even if adultery is not a crime, it still is a violation of marital values and hence should be a ground for divorce.

[6] The respondents have answered the questions from a social and legal perspective and contend that Section 497 was immoral.

IX. CONCLUSION

In conclusion, we would like to give our view on the Adultery Law and its Judgement. The Adultery law had a cynical nature from a man's perspective. It discredited the value of women and made them puppets in a man's hence. Hence, we wholeheartedly support the verdict of the Supreme Court of India. When it comes to our society, it will take time to adjust itself. However, on the whole, the abolition of Section 497 shall be one of the highlights of 2018 and the case law shall be a precedent to several other cases coming in the future.

ACKNOWLEDGEMENT

We take the opportunity to acknowledge our course faculty Dr Patchainayagi S for inspiring us to go forward and write this paper. We also would like to acknowledge our parents who was

always by our side and have us constant support whenever we needed.

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Project and Program Evaluation Process, Consultancy and Terms of Reference with Challenges, Opportunities and Recommendations

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Abstract: Evaluation involves systematic determination of the merit, significance and worth of a project or program by means of a criteria guided by a set of standards. Use of consultants in evaluation brings independence and professionalism in project evaluation. Terms of reference forms the basis of contractual relationship and states clearly the parameters to be measured in an evaluation undertaking by a consultant. Both internal and external evaluations serve the purpose but in general an evaluation should have truthfulness, credibility or beauty, and justice as standards for the process. Consultants should at the end of evaluation make an evaluation report which will facilitate accountability, lessons learnt and improvement of the project or program being evaluated. The evaluation report should be credible, relevant and verifiable and above all acceptable to stakeholders while respecting independence of the evaluator. The consultants' recommendations should be backed by results of evaluation. Evaluation should take care of the stakeholder interests and adequately address them. An evaluation process should be followed by an objective evaluation report which will facilitate accountability, lessons learnt and improvement of the project or program being evaluated. The evaluation report should be relevant to the project, be credible in content and verifiable. Evaluation recommendations by the consultant should be presented clearly, concisely and in order of priority. Recommendations should be supported by specific findings. Application of ethical principles build the trust needed for successful evaluation of projects and programs. Evaluators should give action-oriented recommendations that are specific, practical, and that have a clear indication of responsibility for implementation and anticipated consequences of execution or implementation. For proper evaluation, a qualified and competent consultant should be hired.

Key words: Terms of reference; project evaluation; ToR; benefits of consultancy; role of evaluation consultant; evaluation consultancy, evaluation questions; collaborative models; evaluation stakeholders.

1.0. PROJECT AND PROGRAM EVALUATION AND CONSULTANCY

1.1. Introduction to Evaluation

The very early definition of evaluation is by Cronbach's (1980) who defined evaluation as the process through which a society learns about itself, through many variations. Shadish (1998) identified five components of evaluation theory namely; social programming, knowledge, value, use, and practice. Evaluation involves systematic determination of the merit, significance and worth of a project or program by means of a criteria guided by a set of standards. It can assist an organization, program, design, project or any other intervention or initiative to assess any aim, realizable concept/proposal, or any alternative, to help in decision-making; or to ascertain the degree of achievement or value in regard to the aim and objectives and results of any such action that has been completed (Alkin, & King, 2016; Belford, Robertson, & Jepson, 2017).

Evaluation is a systematic process that is objective and involves analysis and assessment of the organization's policies, programs, partnerships and procedures with respect to a given project or program. According to Shadish, & Luellen (2011) evaluation provides the means to reflect and focus on the project or program performance and progress and involves assessment of policies and activities with the objective of improving, learning and performance. The objective of most evaluations is to gather evidence and analyze findings with the purpose of assessing the impact and effectiveness of various program/project activities. This will then facilitate enforcement of corrective to improve performance and prevent failure of projects and programs (United Nations Commissioner for

Refugees) UNHCR, 2005). According to Conley-Taylor (2005), evaluation is a tool or means used to improve performance in business, community sector and government operations. On their part, Taylor, Purdue, Wilson and Wilde (2005) remarked that evaluation will help project or organization members or personnel learn from their activities, assess effectiveness of effort and establish whether there is progress towards success or failure, and celebrate and build on success. Therefore project evaluation is a failure prevention mechanism employed during execution phase of the project or program.

1.2. Purpose of Evaluation

There is increasing need for organizations to account for the use of resources and demonstrate results realized and value added by the programs and projects. Today's operating environment demands valid, unbiased or impartial as well as credible evidence on project/program relevance, effectiveness, value addition, execution efficiency and effectiveness, impact and sustainability of the project/program. With such a demanding environment, evaluation provides a platform to respond or act on these critical demands. Evaluation is an effective instrument that can be used to address accountability for results and value added for learning purpose and knowledge development, strengthen leadership role and governance as well as facilitate reforms that influence the lives of people globally. Organizations, donors, funders, commissioners and all stakeholders in projects and programs are all interested in knowing objectively what is really going on and the effect of effort made and funds committed in execution of projects and programs under consideration (United Nations, 2014). To evaluate performance, managers should use a performance criteria that measures actual results and compare. A good evaluation should also measure dictators of stability and quality in option. (Conley-Taylor, 2005).

There are a number of specific reasons for evaluation. According to UNCHR (2005) the purpose of evaluation is to;

- i.) Gather and analyze findings to enable assessments of impact and effectiveness of operational activities so that evaluators and evaluated can have clear understanding of what is happening.
- ii.) Evaluation facilitates accountability since the evaluation reports are accounts of status and progress record for current and future references.
- iii.) Evaluation promotes organizational and project/program learning and therefore influences organizational culture, support team building, stimulate partnership and increase institutional and public awareness.

1.3. Benefits of Evaluation

Several benefits are realized from carrying out evaluation of projects. These according to the, World Bank (2011), Taylor, Purdue, Wilson and Wilde (2005) include;

- i.) They facilitate dissemination and strategic review of findings and lessons learnt
- ii.) Facilitate critical review of impact of an operation or activities in a project or program.
- iii.) Facilitate development of recommendations or solutions to enhance success and avoid failure of a project or program.
- iv.) Good evaluation brings together findings that are clear, precise and decisive and respond to critical questions asked about a project or program and reflect learning from the project.
- v.) Used to explain to donors and creditors what has so far been achieved hence keep the relationship and trust.
- vi.) Used to demonstrate the efficiency and effectiveness of project/program resources i.e. time, money, personnel etc.
- vii.) Used to test the relevance of the intervention to the beneficiary needs and aspirations and hence make necessary decisions to create relevance or stop to avoid wastage.
- viii.) Used to facilitate learning from experience.
- ix.) Used to determine or check progress of the project or program execution and realization of objectives.
- x.) Evaluation facilitates recording of progress and hence sharing with stakeholders who can make appropriate timely decisions.
- xi.) Evaluation can be used to determine strengths and weaknesses of the project and improve.

1.4. Steps in Evaluation Process

Project or program evaluation process should be systematic and well-coordinated and managed for successful evaluation. The Government of India (2009), Mitchell (1994), & UNHCR (2005), recommend the following stages in project/evaluation process;

- i.) Problem identification at design level.
- ii.) Determination of problems and tasks to be internally and externally handled.
- iii.) Planning for the evaluation exercise and process upon project approval
- iv.) Development of terms of reference for the evaluation.

- v.) Formation of Evaluation team
- vi.) Identification of possible consultants
- vii.) Doing background search about consultants of interest for the evaluation.
- viii.) Hiring project/program consultants
- ix.) Implementation of evaluation and monitoring of the process.
- x.) Assessing evaluation results obtained
- xi.) Effective use of evaluation findings in line with the evaluation objectives and terms of reference for program or project improvement.

1.5. Stakeholders in project/program evaluation

The type and number of stakeholders in a project or program will vary from one project to another depending on the objectives of the project and the evaluation question being addressed. They include community groups, grant makers/funders, researchers, professionals depending on the industry or project, government representatives and the evaluators themselves. Types of stakeholders in project evaluation

- i.) **Community groups:** These include direct beneficiaries of the project and can directly participate or be represented by elected or appointed representatives who should speak for them. Perhaps this is the most obvious category of stakeholders, because it includes the people directly affected by the evaluation.
- ii.) **Grant makers and funders:** Most grant makers and funders want to know how their money is being spent or used, so the evaluators must find out what they want them to evaluate. Check out all your current funders to see what kind of information they want you to be gathering.
- iii.) **Researchers and specialists/professional:** This includes researchers and evaluators that your coalition or initiative may choose to bring in as consultants or full partners. Such researchers might be specialists in public health promotion, epidemiologists, behavioral scientists, specialists in evaluation, or some other academic field. These professional and specialists have their own concerns, ideas, and questions for the evaluation.
- iv.) **Project/program staff:** These are employees or contractors employed to carry out various activities. They should be involved in evaluation as they can give details of what they have done and how they did it and their experience. They also need to know if they are getting it right from independent evaluators.
- v.) **The commissioner:** This is the person commissioning or engaging the evaluator and is responsible to developing the project and evaluation objectives and questions. He often represents the implementing agency, donor or sponsor of the project depending on the objectives of the evaluation. The evaluator should support the commissioner in carrying out his job.
- vi.) **Project manager:** This is the key contact for the implementation and is in charge of day to day execution of the project. He is key to information on all activities being undertaken and may be interested in knowing results or effects of his actions for improvement.

Different stakeholders have a different perspective or objectives in the project and hence the evaluation process as a whole. Each category is unique, and hence the need to carry out stakeholder analysis to identify the stakeholders and their interests. The evaluator should consider stakeholder interests in developing the evaluation plan.

1.6. Principles of Evaluation

Evaluation has a number of key principles whose application makes the process more effective. According to Taylor, Purdue, Wilson and Wilde (2005) the principles of evaluation are;

- i.) Evaluation is a continuous and not a one-off process that informs planning and delivery of projects.
- ii.) Evaluation should involve all key stakeholders who should participate directly or indirectly in planning and execution including definition of the problem and evaluation questions.
- iii.) Evaluation should be an honest appraisal of project or program progress to facilitate learning from what has worked and what has not worked.
- iv.) Achievements and successes should be highlighted through evaluation and celebrated.
- v.) Evaluation should be used to fight or challenge oppressive policies and practices including discrimination.
- vi.) Successful evaluation should be innovative, imaginative and creative in approach.

1.7. How to Evaluate

Taylor, Purdue, Wilson and Wilde (2005) outlined the step by step approach in evaluation as; review of the situation, gathering of evidence for evaluation, analyses of evidence gathered, and making use of what was gathered and sharing the findings with stakeholders.

1.7.1. Review the situation

Begin by reviewing the situation and plan how to tackle. Understand the problem, needed changes and interventions needed, expected results and how to measure progress towards the results.

1.7.2. Gather evidence to support the evaluation

Evidence takes the form of numbers, people's opinions, view and experiences. Photos before and after interventions may be useful. Beneficiaries and form of benefits need to be captured. Start by establishing a baseline and relevant paperwork for such may include the proposal, past research reports, statistical data, press reports, minutes of preliminary meetings among others. Establish systems for regular data and information updates.

Information can be gathered using questionnaire survey, in-depth interviews, feedback forms, focus groups and round tables, diaries, press reports, observations, case studies, evaluation workshops and review meetings.

1.7.3. Analyze the evidence gathered

After gathering sufficient and relevant data, analyze the information. Identify indicators of progress or failure and change so far realized. Investigate the probable cause and report your findings.

1.7.4. Make use of the evidence

In this step, if there are any goals not met, if progress is below expectation, establish the causes and identify solutions to problems realized. Problem may include changes in organizations that have implications on the project, changing positions and expectations of stakeholders, adverse environmental changes.

1.7.5. Share the evaluation findings

It is a good idea to share findings with stakeholders and other interested parties so that they recognize any problems or issues affecting the project or program or interfering with progress. This will facilitate learning and improvements. Sharing findings that are positive will provide an opportunity to celebrate success and built on it.

2.0. TYPES OF EVALUATION

There are many types of evaluation which consequently call for customized evaluation methods. It is therefore important to understand the types of evaluation that can be conducted over the life-cycle of a projector and their timing. The main types of evaluation are process, impact, outcome and summative evaluation.

2.1. Process evaluation

This evaluation is used to measure the activities of the program, quality and beneficiaries. Process evaluation, answers the following questions;

- i.) Has the project reached the beneficiaries or target groups
- ii.) Are all project activities reaching all parts of the target group?
- iii.) Are participants and other key stakeholders satisfied with all aspects of the project?
- iv.) Are all activities being implemented as intended? If not why?
- v.) What alterations did the project make on intended or initially planned activities?
- vi.) Are the products, services, information and presentations or reports suitable for the target group?

2.2. Impact evaluation

This type of evaluation is used to measure the immediate effect of the program/project and is related or associated with the programs/project objectives. Impact evaluation measures how successful the programs/projects objectives as well as sub-objectives) have been realized or achieved.

The Impact evaluation helps answer the following questions;

- i.) How successful has the project/program realized the intended objectives and sub-objectives?
- ii.) Have the e desired short term changes been realized and to what extend?

Impact evaluation measures the program effectiveness immediate after the completion of the program and up to six months after the completion of the program.

2.3. Outcome evaluation

Outcome evaluation deals with long term effects of the program/project. It is generally used to measure the realization of the program/program goal. Outcome evaluation therefore measures how well the program goal was realized or achieved. This evaluation answers the following questions;

- i.) Has the program /project achieved the overall goal?
- ii.) What factors hindered or facilitate the success or failure to realize the project/program goal?
- iii.) What, unintended change has the program/project realized?

Outcome evaluation is used to measure changes at least six months after the implementation of the program (longer term). Whereas outcome evaluation measures the main goal of the project/program, it can be used to as well assess program objectives (My-Peer (n.d); Zint, n.d),

2.4. Summative evaluation

According to My-Peer (n.d); Zint (n.d), summative evaluation is done at the completion of the program/project. This evaluation considers the entire program/project cycle and assists in decisions making and answering questions like;

- i.) Does the project or program continue?
- ii.) Which part of the project should continue, if yes?
- iii.) Is it possible or necessary to change methodology?
- iv.) Is the program or project sustainable?
- v.) What factors contributed to success or failure?
- vi.) What are the lessons learnt and recommendations from the project/program?

3.0. TERMS OF REFERENCE (TOR) IN PROJECT EVALUATION

3.1. Introduction

To realize high quality project evaluation, it is necessary to develop an accurate, elaborate and well specified Terms of Reference (ToR). Terms of reference are developed during the planning phase for the project/program evaluation undertaking and is initially used to attract and engage evaluation consultants in a competitive processor manner. ToR refers to a document that details an assignment for an evaluator or team of evaluators for a project or program. Terms of reference of the consultant outline the services expected from the consultant (Government of India, 2009). The World Bank (2011) defines, "Terms of Reference" as the document that provides details tasks for evaluators of a project/program. (ToRs). A specific ToR indicates evaluator's requirements and expectations with respect to the evaluation exercise to be undertake. ToR is therefore a prerequisite for evaluation consultancy exercise and should be clear and precise since they are used to measure the performance of the consultant and therefore ToR should mainly focus on effort and deliverables expected from evaluators (Government of India, 2009).

Terms of reference (TOR) define stakeholders in terms of their purpose and structures in the project and working relationships so as work together to accomplish a shared goal of the evaluated project nd programs. ToR of a project/program are at times referred to as the project charter. However there are differences between the terms of reference and the charter in that Terms of reference indicate how project or program should be developed, executed and verified and provide written basis for making future decisions and

confirmation or development of project scope as well as relationship between stakeholders (Government of India, 2009). For this to be realized, success factors/risks and constraints need to be identified ahead of time. According to the World Bank (2011) the ToR document defines all aspects of how a consultant or team of consultants will carry out a monitoring evaluation by clearly stipulating objectives and scope of evaluation, roles and responsibilities, and resources for the evaluation process. With all this information, it is noted that ToR forms the basis of contractual relationship and states clearly the parameters to be measured in an evaluation undertaking.

The timings are important in developing of ToR for a consultancy. The ToR should be created during the earlier stages by project designers, immediately after the approval of a project. They are preferably documented by the project manager and presented to the project sponsor or sponsors for input and approval. Once the terms have been approved, the members of the project team have a clear definition of the scope of the project. They will then be ready to progress with implementing the remaining project deliverables (Government of India, 2009; World Bank, 2011).

From the above discussion, "terms of reference" in project/program evaluation thus refers to a set of tasks and deliverables assigned to a consultant, advisor or team of consultants and advisors. The consultants or advisors is engaged by means a contract having terms of engagement that incorporate the terms of reference stipulating the consultant's task.

3.2. Specific Roles of Terms of Reference

According to Government of India (2009) and Mitchell (1994) Terms of reference clearly define the following aspects of a project or program evaluation;

- i.) The evaluation methodology to be used by evaluators
- ii.) Identify resources and funds committed for use in the evaluation process including, financial and physical infrastructure.
- iii.) The evaluation vision, objectives, scope, targets and deliverables of the evaluation in terms of what must be achieved.
- iv.) Identify evaluation stakeholders, their roles as well as their responsibilities in the evaluation. This helps in defining participants and their interests and therefore indicate those who will take part in the evaluation either directly or indirectly.
- v.) Specifies plans on resources, finance and quality plans i.e. how the process will be realized and expected level of quality.
- vi.) Provide evaluation work breakdown structure and task schedules hence specifies when deliverables should be achieved and how this will be done.
- vii.) It stipulates or spells out responsibilities of the consultants and clients.
- Viii.) Shows how to realize and measure the required parameters in the evaluation.
- ix.) Clear identification of participants in the evaluation process including staffing and relationships between them.
- x.) Timelines for milestones and completion of the evaluation exercise.
- xi.) Clear declaration of reasons for evaluation and users of the evaluation results and reports.
- xii.) Shows what should be accomplished i.e. actual expected results and outputs of the evaluation exercise.

3.3. General Functions of ToR in Project Evaluation and Methodology used

The terms of reference provide a number of functions which according to World Bank (2011), these include the following;

- i.) Background information as well as rationale for the project evaluation by describing the project along with its key milestones and history of the project or program. A ToR will include a brief review of known facts about the project or program that will facilitate general understanding of what the project or program is all about.
- ii.) It is used to develop or identify specific evaluation questions through development of the scope, process as well as expected results for key evaluation tasks and by so doing it justifies the evaluation process. The valuation question provide guidance on how the evaluation will be carried out and what to look for in the evaluation.
- iii.) The terms of reference defines the scope, approach and methodology to be used by specifying evaluation scope in terms of time, period, and depth of evaluation. It guides the evaluation in terms of degree to which they can provide additional or alternative methods of executing the tasks. Therefore evaluation ToR describes the scope in terms of depth and timelines, approaches as well as methodology to be used in the evaluation.
- iv.) Prescribes or articulates the leadership and accountability arrangements including the structure, established resources and hierarchy for accountability during the project evaluation. In this case, roles and responsibilities of stakeholders are stipulated.
- v.) Facilitates scheduling the process by specifying the deliverables, their timelines and work plans. ToR may determine the products as well as services to be developed as well as development of detailed timelines.

- vi.) Terms of reference provides the guiding principles and value systems in terms of ethics and procedures desired to be followed by project evaluators. It specifies research ethics or procedures that monitoring evaluators are expected to follow as they execute the task.
- vii.) It makes possible and ease the determination of the budget and hence allocation of resources for use by evaluators in the evaluation process.
- viii.) The terms of reference determine and fix professional qualifications of evaluators as a team or individuals which includes their experience, credentials, competencies and expected moral and ethical standards including their experience and desired competencies.

3.4. Contents or Scope of Terms of Reference For Project Evaluation

To execute its functions, the ToR contains several elements and features. According to Government of India (2009), Mitchel (1994), & World Bank (2011), they include;

3.4.1. Background information and rationale of project evaluation exercise.

The background of terms of reference is contained in in the opening section of ToR document. The section gives the overall program or project activities that are to be evaluated. The focus of this section is;

- i.) Objectives or purpose of the program or project being evaluated.
- ii.) The rationale of the project being evaluated
- iii.) The historical perspective of the program or project in terms of progress and orientation
- iv.) The project or program operating environment i.e. organizational, economic, regulatory, environmental and social perspectives.
- v.) Key stakeholders and their specific and general roles and responsibilities in project design, implementation as well as evaluation.

3.4.2. Specific Objectives and Evaluation Questions

This is a brief but important section of terms of reference and includes

- i.) Specific project or program evaluation questions
- ii.) Expected use of evaluation results and reports
- iii.) Targeted users and stakeholders of project/program evaluation

It is desirable not to have lengthy objectives and use clear and focused language that is free of technical jargon or complex terms to facilitate general readership and understanding.

3.4.3. Evaluation Questions

There should be logical progression between purpose of evaluation, specific objectives and evaluation questions with questions being focused and specific. Evaluation questions are used to further focus the evaluation and should capture, the purpose of the evaluation exercise and process as well as the priorities set for the evaluation and stakeholder needs and expectations.

3.4.3.1. How to develop evaluation question;

CDC (nd.) suggests the following process of developing evaluation question;

- i.) Involve all key stakeholders and review the logic model for the project being evaluated.
- ii.) Brainstorm over the evaluation questions with staff and other stakeholders. They should be asked to develop own evaluation questions about operations, implementation as well as expected project outcomes with their interests, perspectives and concerns being well articulated, captured or presented in the evaluation questions formulated.
- iii.) Classify the evaluation questions into process and outcome questions.
- iv.) Prioritize the evaluation questions inn order of importance to the program objectives and activities, program staff and stakeholders.

3.4.4. Scope of Evaluation Work

This section of the terms of reference presents parameters of evaluation with respect to scope and limits. The scope should be realistic in terms of available time and resources. The details of this section includes;

- i.) The time period and project component covered by the evaluation process.
- ii.) Highlight of other existing or planned evaluations on the same subject with the study either building or complimenting relevant activities.

- iii.) Evaluation target groups e.g. beneficiaries or other stakeholders depending on purpose of the evaluation.
- iv.) Main issues or items that are not within the scope like aspects identified by the evaluation commissioner as difficult to analyze or not useful for the purpose of the evaluation.

3.4.5. Approaches and Methodology

This section of terms of reference declares how the project/program evaluation will be conducted with several key elements highlighted that include;

- i.) The methodological framework to be used like case study, sample survey, desktop reviews, mixed method, etc.
- ii.) Evaluation data to be collected, data collection instruments and presentation techniques.
- iii.) Outcomes, outputs, as well as indicators proposed or used to measure performance
- iv.) Availability and access to relevant data like existing local, regional or national data
- v.) How to verify findings with key stakeholders in the evaluation process or exercise.
- vi.) How to engage with or interact with other stakeholders for example through meetings, workshops, conferences etc.
- vii.) How to involve other participants and stakeholders in the steering committee and other forums for the purpose of the evaluation.

3.4.6. Governance and Accountability requirements

In this section, the terms of reference specify the management, administration and governance arrangements for carrying out the project evaluation exercise. Any provision for decision making, guidelines and arrangements are stated in this section in form of organization and functions. An evaluation chart may also be presented indicating relationship between participants and stakeholders.

3.4.7. Values and Guiding Principles for the evaluation

This section of the terms of reference outlines research ethics or procedures to be adhered to by the evaluators. The commissioner may include references and evaluation specifications as well as standards as outlined by various professional organizations or associations like United Nations, UNDP and other relevant professional and regulatory bodies. The sections could also appear within scope or background sections.

3.4.8. Professional Qualifications of evaluators

The evaluation terms of reference clearly specify the profile of evaluators or team of evaluators, as individuals or a team. The details of these section include;

- i.) Specific expertise, skills and experience that the evaluator or team is required to have or possess language proficiency, country, regional or national experienced, evaluation skills, technical competence in evaluated area among other considerations.
- ii.) Whether an individual or team of evaluators is needed for the evaluation.
- iii.) How to integrate different experts in the team for the case of team evaluation

4. Expected level or degree of distribution of responsibilities among leader and the team member for an evaluation team.

As evidence for the required attributes, the evaluation commissioner may ask for curriculum vitae, referees, samples of previous work reports and certificates.

3.4.9. Deliverables and Schedules

This section of the ToR document contains the outputs and reporting requirements expected of the evaluators. The details covered in these sections include;

- i.) Structure and format of each product or service like length, contents, size etc.
 - ii.) Communication style and language in which deliverables can be written by evaluators.
2. Clarification or detailed information about the types of products like reports, presentations, uses and how they will use the reports and products of evaluation.
 3. Expected standards and practices established by the organization that guides on formats for written documents.
 4. Set or expected timeframes and products milestones for major activities in evaluation process or exercise.
 5. Information or details on meetings, consultations and frequency of such meeting including participants in the course of evaluation and thereafter.
 6. The indicative work plan and schedule for completion of each task

3.4.10. Budget and Payments

In this section, the commissioner should consider availability of funds for use in execution of envisioned activities and tasks. The ToR may also require potential evaluators to develop their own budgets based on their proposed activities and tasks. This sections also contains details on payments like frequency and amounts, currency, mode of payments and accounting and other critical details relating to payments and accounting. In this section, inputs or resources to be provided by the authority or commissioner for the evaluation work are declared.

3.4.11. Structure of Proposal and Submissions

The ToR provides instructions on format of proposal, contents, submission process and details about;

- i.) The structure with list of topics to be included.
- ii.) Deadlines for submission and other activities of proposals.
- iii.) Means or mode of submission or transmission of documents and reports.
- iv.) Number of copies and recipients or contact persons
- v.) Methodology or criteria and timelines for selection and other milestones
- vi.) Opportunities for clarifications or appeal if any is provided by the commissioner.

3.4.12. Additional Resources

The ToR should identify useful information source for evaluators to access. Acceptable references may be listed in the text or material may be appended as annexes of ToR documents to help or guide evaluators.

3.4.13. Desirable Features of terms of Reference

A good ToR should be brief and concise and typically consist of 5 to 10 pages with desirable annexes depending on the project or program under evaluation. The specific contents of and format of Tor document varies based on;

- a.) Organizational requirements with respect to the project and evaluation
- b.) Local practice with respect to the project or program and evaluation requirements
- c.) Type of assignment to be undertaken

3.5. Evaluation of Similar Consultancies and Duplication of Effort

In cases where the commissioner or authority requires a consultant on several related or similar projects and programs, hence a similar ToR is required, it is economical and efficient, a cluster of these projects/programs can be combined into one package and a single evaluator or team of evaluators selected for the tasks with duplication of effort (Government of India, 2009).

4.0. CONSULTANCY IN PROJECT EVALUATION

A consultancy is advisory service contracted to a qualified person who carries out monitoring in an objective and independent manner. Consultancy is also rendering independent expert or professional advice about an issue or problem (Sarda, & Dewalkar, 2016).

4.1. Parties in a Consultancy

The main parties in a consultancy are the consultant and the client or commissioner of the exercise and both parties have binding obligations towards one another as stipulated in the consultancy contract.

4.1.1. Client/ commissioner

The client or commissioner is the organization, corporate, group of individuals or an individual who procures or engages the services of a professional consultant for an agreed project or program or activity for a specific period time on agreed terms and conditions.

4.1.2. Consultant

A consultant is an expert or professional who provides advice in an area of competence and experience. The consultant analyses data and information and uses it to advise the client so as he makes the best decisions and choices for a given scenario. A monitoring and evaluation consultant are therefore a professional or firm that provides professional service to a client or commissioner in project monitoring and evaluation.

4.1.3. Consultancy Contract

This is a binding relationship between a consultant and the client which stipulates the terms and conditions of the agreed consultancy.

4.2. THE EVALUATION CONSULTANT

4.2.1. Role of Consultants

Consultants have several functions they play in the cause of evaluation consultancies. According to Turner (1982), consultants do the following roles;

a.) They provide specific information to a client.

Consultants generate and provide information on a project/program by gathering facts and compiling using surveys, cost and /or benefit analysis, feasibility studies, market research, analyses of the composition and structure of an industry or business. For a project, analysis of project indicators and other observable variables. The project commissioner may also have data may be unable to spare the time and resources to develop the data internally, hence the need for a consultant.

b.) They solve a client's/commissioners problems.

Quite often, consultants receive difficult problems to solve in the cause of their work but their work is to get answers to problems. The consultant also has a task and responsibility to ask whether the problem is framed in best way. Often the client/commissioner needs guidance in defining the real issue or problem with respect to the project. Therefore the consultant should start by investigating the context of the problem and work with the problem as defined by the client a way that leads to a more useful problem definition.

c.) They carry out diagnosis, which may necessitate redefinition of the problem.

The consultant's value lies in their ability to diagnose, a process which may lead to strained consultant-client relationship. Reasons may include employees who may be fearful of being found culpable. A good diagnosis should go beyond obvious examination of the external environment, the technology and economics of the business, and the behavior of workers. The process of executing independent diagnosis is often a major reason for employing consultants, and is more successful if the client or his team is involved. Joint consultant-client approach to work enables managers to comfortably begin implementation of corrective action even ahead formal recommendations making consultancy more effective and useful.

d.) They make recommendations based on their diagnosis for client decision making

A consultancy concludes with a written report and/or oral presentation which summarizes what the consultant has learned and recommendations on what the client should do to improve the situation. The exercise should present recommendations that are related to the diagnosis on which they are based. It is advisable for the consultant to make recommendations, but it is the client who decides whether and how to implement. For best decisions to be made the consultant should provide clear guidance and information to support decision making.

e.) Assisting with implementation of recommended solutions.

A consultant often ask for a follow-up engagement to help install a recommended system. Effective work on implementation problems requires a level of trust and cooperation that is developed gradually throughout the engagement process. A consultant should strive to identify recommendations that can be implemented. If a consultant's assignment has a goal of building commitment, creating learning, and developing organizational effectiveness, a consultant should always suggest implementable recommendations.

f.) Building a consensus and commitment around corrective action.

The consultant should provide clear and convincing recommendations. The consultant should be persuasive and have good analytical skills and have ability to design and conduct a processes for;

- i.) Building consensus or agreement about crucial steps to be undertaken and
- ii.) Establish momentum or motivation to see the necessary steps through.

A consultant's observation should well summarize this. The consultant should establish enough consensus t within the organization that the desired or proposed action makes sense. For this to happen a consultant should have good problem solving ability as well as persuasion skills to convince through logical analysis. Sufficient key stakeholders should be, should be mobilized for support and hence success of a project.

g.)Facilitate client learning by teaching the clients how to resolve problems in the future.

Consultants enable learning by incorporating employees and other stakeholders of the client organization in the evaluation processes. In some cases however, members of management may need to acquire complex skills that may only be acquired through guided experience long period of time. Participation by the client or his representatives in the evaluation process, provides opportunities for learning needs. The challenge is that managers may not be comfortable with being taught what they should be knowing. Consultants should learn to be more effective in designing and executing projects in.

h.)Enable permanent improvement in organizational effectiveness and efficiency.

Successful implementation of evaluation consultancies requires new, concepts and techniques in management, change in attitudes with respect to management and control functions and changes in how organizational functions are executed. Many projects induce change in one or more aspects of the organization's functioning that may prove counterproductive because it doesn't combine well other aspects of the system. While working on current issues, a consultant should address future needs of the organization, project or program even though we rarely have important changes in human resources function just because of a consultant's recommendation. Consultants ought to encourage clients to improve organizational effectiveness not just by writing reports and recommendations, but by modeling methods that work well for the organization or project under evaluation. A professional diagnosis by the consultant should cover or include assessment of overall organizational effectiveness, and the consulting process should help address various barriers to better performance now and in future by the organization.

4.2.2. Desirable qualities of Consultants

To be effective in his work, an evaluation consultant should have several desirable professional, academic and ethical competencies. According to United States Department of Health and Human Services (2011), NSI (2013), and World Bank (2011) a consultant should have desirable competencies, experience and knowledge that include;

- i.) The consultant should have knowledge of the project or program being evaluated.
- ii.) Should have a clear understanding of the legal and ethical requirements applicable to the evaluation as well as the project and program being evaluated.
- iii.) Should have knowledge and understanding of current trends in evaluation and the project or program under consideration.
- iv.) Should have specifically required professional knowledge acquired through education and work experience
- v.) Should have ability to engage in collaborative problem-solving with stakeholders
- vi.) Should be a good communicator with effective oral and writing skills
- vii.) Ability to work with individuals and teams
- viii.) Ability to develop and use data collection methods like questionnaire, interview guide
- ix.) Ability to analyze and interpret collected data
- x.) Have good negotiation skills so that he can handle crises and conflicts in project/program evaluation.
- xi.) Possess good observation skills to facilitate learning and experience from the project or program.
- xii.) Should be morally upright and responsible person in his/her dealings.
- xiii.) Should possess high level of professionalism
- xiv.) Should be technology friendly so that he can use modern digital analytical tools that make work effective and efficient.
- xv.) Should be honest and have good attitude towards work and environment as a whole.
- xvi.) Should be able to manage rejection if and when it is encountered in the course of his work
- xvii.) Should be familiar with cultural environment of the project and program under consideration to avoid conflict or confrontations.
- xviii.) Should be flexible and not rigid so that they can adapt to changing environment in terms of teams and individuals as well as physical and sociocultural environment.

5.0. TYPES OF CONSULTANTS

Consultants can be classified as internal or external

- i.) Internal Consultants
- ii.) External consultants

5.1. Internal Versus External Consultants

Making use of either internal or external consultants has both advantages and disadvantages. However, in either case there are more benefits than the disadvantages if the commissioner or client one knows when and how to make use of these two types of consultants (Reddy, nd). According to Conley-Tayler (2005), factors that may influence the choice between internal and external evaluation include; specialized skills, perceived objectivity, flexibility, costs involved, availability of evaluator, ability to collect correct information for evaluation, accountability requirements and expectations, willingness to criticize, mode of results dissemination and recipients, knowledge of the project/program context, ethical issues and concerns, and use of the evaluation results.

5.2. Internal Consultants

These are consultants who double up as employees of the commissioner or client (Conley-Tayler, 2005).

4.2.1. Benefits of Internal Consultants

According to IDRC (2012) and Reddy (2019), benefits arising from use of internal consultants include;

- i.) Unlike external consultants, internal consultants understand the operating environment, its culture and the people and so are better placed to get to the root or bottom of any existing problem more successful and this insider perspective from internal evaluators adds value to the process and hence outcome of evaluation.
- ii.) Quite often, workers take time to get used to and cooperate with external consultants compared to internal consultants and this makes the work of external consultants challenging therefore internal evaluation give timely information for quick decision making.
- iii.) Internal consultants understand the tasks, processes and status of the project and so they can finish the exercise faster and with more precision because they have better understanding of the project and operating environment. External consultants rarely give this benefit of buy-in like internal consultants.
- iv.) It is cheaper to use internal consultants because expenses like extra travel and accommodation needed by an external consult are not necessary as they perform within employment status and terms with little or no extra expenses to incur.
- v.) Little or no collaboration is needed when using internal consultants making the process faster than a team of external consultants who often need collaboration with program staff or. This makes the process faster with no real chances for miscommunication.

5.3. External Consultants

An external consultant is an outsider or non-employee of the client or project/program Commissioner.

5.3.1. Benefits of external consultants

According to Conley-Tayler (2005) Reddy (2019), benefits arising from use of external consultants include;

- i.) Internal consultants having worked around for sometimes may find it hard to find flaws in the systems unlike external consultants who assume a more neutral approach and hence are more objective hence diagnosing a problem is easier for them.
- ii.) Since internal consultants are used to handling things in a given way, it is difficult to walk the extra mile and develop new and creative ideas unlike external consultants who are more flexible and can handle wider scope and greater depth into an issue leading to innovative and creative ways of solving crises.
- iii.) External consultants approach their work without bias, they are able to give an honest opinion and therefore under certain conditions, having an external consultant will give a true picture of what is happening compared to an internal consultant.
- iv.) External consultants take their work more seriously since that is their source of livelihood and will therefore be keen at digging for more information on various issues and these leads to better results and more detailed findings.
- v.) The use of external consultants guarantees professionalism in the process since the exercise is cushioned from internal power plays, mistrust, competition and rivalry which frustrate the process and pollute the results.
- vi.) There is more public confidence or trust from stakeholders in an evaluation done by an external consultant than one done by an internal consultant from the neutrality and professional point of view.

5.3.2. Disadvantages of external consultants

There are a number of limitations for hiring external consults. According to IDRC (2012) these disadvantages include

- i.) External evaluations can be costly compared to internal evaluations
- ii.) External evaluations are difficult to manage and are time consuming
- iii.) In some cases, it is difficult to find appropriate or relevant evaluators who understand the substance and context being evaluated.

5.4. Validity of Evaluation

According to Conley-Taylor (2005), it is possible to get transparent evaluation from external and internal evaluators, but the use of an external evaluator brings some impartiality and legitimacy to the process and results even though both internal and external evaluators have own biases.

Conley-Taylor (2005) and House (1980) identified three criteria for validity of an evaluation i.e.

- i.) Whether it is true
- ii.) Whether it is credible
- iii.) Whether it is normatively correct.

They remarked that there is no one right approach to an evaluation process, and so the closer the approach is to a prevailing situation, the better it will be in terms of acceptability. Cronbach et al. (1981) remarked that excellence of an evaluation should be judged against its ability to serve a society or stakeholder. An evaluation pays off to the level or ability to give ideas and solutions clearly.

Peck, Kim, & Lucio (2012) affirmed that, beauty, truth and justice are the basic standards for evaluation. Where the evaluator and decision maker are the same, selection of standards is relatively easy since the evaluator can apply his or her standards of evaluation and make judgment as the decision maker. If the evaluator and decision maker not the same persons, then credibility of the evaluator is a consideration. The decision maker has a duty to determine if facts from the evaluation are correct and whether or not the evaluator is truthful. At such a point, communication and credibility become critical consideration, reflecting a relationship between the two parties in the evaluation. For the case of a public program the evaluation holds collective value. Decision makers could include a large number of stakeholders. Apart from truthfulness and credibility, an evaluation undertaking should consider justice for all stakeholders. Therefore truthfulness, credibility (beauty), and justice are standards for evaluation process.

5.5. Consultancy Styles

A consultant can be classified based on the type of consulting style used, the process applied in consultancy or the level of consultant involvement during the consulting process.

5.5.1. Expert Consulting Style

The consultant uses his expertise and knowledge to diagonalize and solve the problem for the client. It is favorable style where the client wants a quick solution with his own little involvement in solving the problem. The problem with this style is that the client does little or no learning hence little or no internal learning and capacity building.

5.5.2. Process Consultant

In this consultancy style, the consultant helps the client to think through the problem and generate own solutions to the problems.

5.5.3. Classification Based on level of involvement in the project

Consultants come in all sizes and different types. According to Ucko (nd.), consultancies range in sizes from individual consultants to multinational consulting firms or companies. Ucko identified four types of consultants. A consultant or team of consultant can operate in more than one style, depending on the project characteristics. It is the responsibility of each consultant to select the most appropriate type or style of consulting. Based on the level of involvement, a consultant can work as;

- i.) Data or information gatherer
- ii.) Advisor
- iii.) Doer
- iv.) Coach

Table 1 below shows the four types of consultants with their services, deliverables with specific examples of the consultants.

Table1: Four types of consultants based on operating/working style

Type of Consultant	Information Gatherer	Advisor	Doer	Coach
Service provided	Provides only Information	Advise and recommendation	Act as staff implementing systems and programs	Helps the commissioner do some tasks that he cannot do better
Deliverables	Written report of evaluation	Oral or written report or both	Installs systems or does the task	System, tasks and learning experience
Examples	1.Market research 2.Economic forecast	i.)Organizational design ii.)Selection of appropriate computer system	i.) Payroll system execution ii.)Training program iii.)Computer	i.) Management coaching, ii.)Organizational Team building

Generally, the doer is able to function in three different ways as a pair of hands, expert and partner as follows:

- i.) As an **expert**, telling you what you should do hence the work is advisory.
- ii.) As a **pair of hands**, the consultant does actual execution of instructions just like an employee.
- iii.) As a **partner**, the consultant collaborates with the client in an equal or symbiotic manner where both parties act at par to one another or as equals.

It is therefore necessary that while selecting a consultant to work as a doer, the Commissioner should be sure which of the three roles will be performed.

5.6. Client -Consultant Relationship Model

The nature of relationship between a consultant and client or commissioner comes up with four models of collaboration, namely, collaborative or process model, clinical or doctor patient model, engineering model and the survival model.

The table 2 below shows the relationship between client influence and consultant influence and the resultant relationship.

Table 2: Relationship between client and consultant influence

	High Consultant influence	Low Consultant Influence
High Client influence	Collaborative/Process model	Engineering Model
Low Client influence	Clinical Model	Survival model

i.) Collaborative /Process Model

In relationship there is mutual influence and joint commitment to goals and objectives where both the consultant and client view consulting as a learning experience where they learn from one another.

ii.) Clinical model (Doctor-patient model)

In this type of relationship, the consultant possesses a higher degree of influence over the client, so the quality of relationship is a function of the quality of professional expertise. The client provides data and responds to queries raised by the consultant. The client assumes the role of a patient as the consultant assumes the role of a doctor.

iii.) Engineering Model

In this relationship or model, the client possesses a higher level of influence over the consultant and as a result, the client directs the consultant during the evaluation process.

iv.) Survival Model

In this type of model/relationship, both the client and consultant lack influence over one another and as a result they both struggle to survive in the working relationship. Effectively the consultant does not receive support from the client and is instead seen as an intruder and so the consultant encounters hostility, rejection and is treated with contempt and suspicion.

5.7. Selection Criteria for Consultants

Generally speaking, expertise and specialty, impartiality and fairness, cost implications, and time requirement are key considerations for employing an external consultant or team of consultants. The level of complexity and scope of the task may require an external consultant, nature of political sensitivity of the program or project may also demand high level of impartiality and hence the need of an independent external consultant. In some cases, it is just lack of personnel and time making choice for an external evaluator the best option (IDRC, 2012). There is need to have a transparent scoring matrix that emphasizes the Sponsor’s strategy and service needs without bias to any one firm. Typical examples of criteria include understanding of the project, key personnel qualifications and experience, firm’s qualifications and recent experience as well as judgment on ability to meet project schedule.

A recommended criteria is used in the selection of evaluation consultants who are interested in the evaluation undertaking through submission of evaluation proposals. The selection committee should assign points to various attributes used for the consultant rating. (NSI, 2013). The choice of a consultant could be internally or externally motivated for different reasons. However key considerations in consultant selection according Indian Government (2009), NSI, (2013) and World Bank (2011) are;

i.) Capacity to execute all the services required

The consultant should have the necessary resources to perform all of the services required. This include planning, surveying, software, etc. The consultant or firm selected should have professionals with skills and experience to work on the project.

- ii.) Should have adequate experience on related or similar project being evaluated.
- iii.) Ability to meet the schedules and deadlines of the project. The consultant should have competence, timeliness, and quality of performance to work on the project. The consultant or team should have sufficient time to devote to the project in order to meet the schedule submitted in the proposal. In this case, his workload and capacity can be examined for decision making.
- iv.) Proposed technical approach and schedule to accomplish the project should indicate the consultant's understanding and familiarity with the particular requirements of the project or program to be evaluated. In particular, the consultant should be familiar with relevant planning and execution guidelines and requirements.

5.8. Selecting the Ideal Consultant

The very first thing to consider when selecting an external evaluator is the type of evaluation and corresponding role of the consultant evaluator. This is because different evaluation types require different roles of the consultant and so are the methods used in evaluating. Therefore Before interviewing candidates, there is need to specify the desired characteristics of the right or ideal consultant for the project to be evaluated.

It is however not always easy get a consultant who exactly matches the desired specifications, but it is possible to get closer to what is desired. According to NSI (2013) and IDRC (2012), an ideal consultant can be determined by attempting to answer questions;

- i.) Relevant experience: How much experience in similar projects the consultant should have and if at all similar experience is a prerequisite.
- ii.) Industry background: Whether or not the consultant needs to have previous experience in the specific project, program or industry.
- iii.) Cultural compatibility: This considers personal characteristics of the consultant required for example whether or not the consultant should be reserved in nature and approach or outgoing, easygoing or tough acting. In some cases the consultant may be required to adhere to some dressing codes.
- iv.) Ethical issues or Integrity: Integrity may be a key aspect of some evaluations, in some cases it may not be the main concern. Some potential consultants may have integrity issues and this may be considered in the selection while some undertakings may demand the use of consultants who are known and respected by peers in the field.
- v.) Location of the consultant: In some evaluations, a quick undertaking may be required and so ready availability of a local consultant may be a requirement while in some assignments the client or commissioner simply wants the best regardless of where they can be found.
- vi.) Size of consultant's firm: Some evaluations are more diverse and complex than others. For small assignments or undertakings, only one person can carry out the task hence size is not important. However in complex undertakings, diverse skills and more numbers may be a requiring hence need to go for large diversified firms or a consultant with more human and physical capital.
- vii.) Language and level communication skills: If communication ability or skills is important for the task, a consultant with such skills and attributes will be selected. In some cases, the client may be interested in a consultant who is able to understand and communicate in a specific industry jargon or s project specific terminology.
- viii.) Profile of Consultant or Status: In some cases, a client or commissioner only wants to deal with known names or personalities in evaluation. In this case the profile of the consultant will be very important. In some evaluations, the client may prefer someone who is still building his or her reputation in the field.
- ix.) Project evaluation objectives and goals of evaluation: The client may just be after having a problem solved, or while in some cases he wants to learn how to solve similar problems in future. Where learning is one of the objectives, then a consultant with strong interpersonal and teaching skills will be selected. If the client wants a consultant to personally solve the problem then experience in solving similar problems become a requirement.
- x.) Availability of the consultant: The client may immediate undertaking while in some cases urgency is not a priority. In case consultant has many other ongoing projects, then chances are he will delay and so may not be appropriate where the client needs quick results in a short period of time.
- xi.) Approach to consulting: The nature or form of results may also influence the selection of a consultant. In some cases the client or commissioner needs written reports while in others oral reports are needed. The client may also want something's implemented, while in others recommendations enough. Some evaluations need a close working relationship, or while in other, the evaluator's total independence is required. In either case, consultants who best deliver the expected output will be preferred and hence selected.
- xii.) Evaluation fees or charges: The consultants will also be selected based on the fees or charges they demand and available budget. Often a consultant who has best technical and financial

6.0. CONSULTANCY CONTRACT

6.1. Elements or Contents of Consultancy contract

Important elements or contents of a consultancy contract are;

- i.) Contract term or duration of evaluation which stipulates when the agreement takes effect and when it ends.
- ii.) Project evaluation objectives which determines the expected results of evaluation

- iii.) Definition of success and requirements for success: This specifies what success is and how it is measured and who measures it including the standard of measurement.
- iv.) Scope of the project or program evaluated: In this section, project work plans and processes are considered together with tasks and activities to be undertaken.
- v.) Project deliverable or products and services: In this section, the consultant is informed about what he has to deliver or leave behind e.g. a working system, evaluation report, oral report or presentation, interim and final reports due.
- vi.) Ownership of the product. There are cases where consultant's product and services have rights with commercial value. Clarification is provided in this section on transfer or ownership of any copy rights and whether or not the consultant will be able to sell the same program to other customers. The commissioner's expectations about copyrights may also influence the selection of a consultant. .
- vii.) Confidentiality: Since consultants often have access to confidential or proprietary information. It is necessary to agree disclosure of such information to others and limits if any.
- viii.) Communications: The contract specifies forms of communication with the consultant. This can be regular phone calls, meetings, written progress reports or formal reviews. The frequency of communication is also specified.
- ix.) Project or program Staffing: The contract specifies who works on the project, substitutions, and numbers involved.
- x.) Supervision of the consultant: the contract specifies who will supervise the consultant or be the consultant's primary contact during the evaluation.
- xi.) Scheduling. This shows when the project starts, milestones expected and dates, as well as expected completion time and dates.
- xii.) Incentives and penalties: This section specifies any financial incentives and penalties available for good performance and completion ahead or behind schedule. .
- xiii.) Termination of Contract: This section specifies circumstances and method of ending the contract hence notice requirements and penalties if any will be specified.
- xiv.) Cancellation policy: This section stipulates circumstances and consequences of stopping or cancelling the project before it commences. This includes notice requirement and penalties applicable.
- xv.) Arbitration: Disputes may arise in the course of evaluation or execution of the contract. Disputes may arise over fees, deliverables, fees, or other items. This section clarifies how such disputes can be resolved through arbitration and conditions for arbitration.

6.2. Consultancy fees

The evaluation fee set should be simple in structure for the client to understand and should be based on the principle of indifference such that the consultant does not become devastated by lose of the contract or feel shortchanged by himself or the client. The consultation fee can be based on;

i.) Time Charges

When charging for time, consultant will multiply an hourly or daily rate (the "billing rate") by the actual number of hours or days spent on the project. Quite often, the consultant will quote an estimated fee or fee range in advance.

ii.) Project Fees

In this mode, the client and consultant agree in advance on a fixed fee for the exercise regardless of time spent. Consultants calculate project fees by:

1. Multiplying their billing rate by expected duration of the undertaking.
2. Charging what they think the task is worth
3. Charging what the market will bear for the undertaking. .

ii) Retainer fees

In this case consultants receive regular monthly payments for the work in exchange for repetitive work like analysis of financial statements or other program statements, discounted bills or guaranteed availability

7.0. THE EVALUATION EXERCISE BY EVALUATOR/CONSULTANTS

The evaluation exercise starts with the invitation for consultants to bid for contract to carry out evaluation process. After review of bids or submission by interested consultants, the best qualified is selected. This is followed by;

- i.) The selected consultant or evaluator meets the commissioner or client
- ii.) The consultant develops an evaluation proposal
- iii.) Upon agreement with the commissioner, a consultancy contract is signed
- iv.) Development of data collection tools
- v.) Data collection needed as evidence for the evaluation.
- vi.) Collected data analysis and presentation of results.
- vii.) Making conclusions and evaluation report writing
- viii.) Dissemination of transmission of results and report to the commissioner stakeholders

- ix.) Validation of reports
- x.) Termination and exit of the consultancy.

In some cases the evaluator may have a closing meeting with stakeholders before or after production of the final report in a way that may allow input but not in a way that will compromise his/her independence as consultant or evaluator.

8.0. ETHICS IN EVALUATION CONSULTANCY

Ethics in consultancy is the act of doing what is expected of you as a consultant by the stakeholders. Ethics is acceptable standard of professional conduct and practice that is anchored in a profession. It represents attitudes, principles and norms that are considered appropriate for success of a given profession that leads to customer satisfaction (Kabeyi, 2018). Both external and internal evaluators face several ethical issues of concern which should be managed (Conley-Tyler, 2005).

8.1. Code of ethics in project/program evaluation

Code of ethics refers to a document that outlines the principles of conduct to be adhered to while engaging in a given professional exercise. The benefits of having recognized ethics in evaluation are that it limits the need for tough legal precautions and provisions in the relationship between the client/commissioner and the evaluator or consultant. This simplifies the evaluation process and creates an environment of trust for evaluation. The degree of ethics is a function of the organization and the individual consultant since organizations also influence ethical behavior and conduct. The ethics in evaluation forms the basis for self-regulation and hence confidence and positive engagement between the consultant and the commissioner or client. Ethics can be said to be a trust building mechanism in evaluation (Kabeyi, 2018 & Vallini, 2007).

The main ethical problem is with respect to other stakeholders interests which are often not clear and so the fundamental ethical principle in this case is to be, to determine the interests of other parties or stakeholders in the evaluation and respect them without harming them. Being intellectuals, consultants have a direct and personal relationship with clients and this often leads to ethical dilemmas. In project consulting, decisions with respect to the main objective of the project and exercise should never be oriented to the interests of the consultant but should be aim at supporting the commissioner's business goals. Where the consultant's principles appear to be in conflict with the main objective, the best to do is to reject the appointment (Vallini, 2007).

8.2. Ethical Dilemmas in consultancy

Vallini (2007) identifies the following cases of ethical dilemmas for a consultant

- i.) Helping a client avoid or reduce tax liability
- ii.) Helping a client avoid legal liability
- iii.) Help a client exploit loopholes in a contract for his/her advantage or gain over the other party
- iv.) Help a client eliminate neutralize a competitor with technology or other ,means

8.3. Ethical guidelines conduct in consultancy

A consultant may find himself in an ethical dilemma. This is a moral situation where the consultant has to choose between two equally undesirable alternatives. These may arise due to a number of reasons, circumstances, attitude, individual and organizational behavior, failure of personal character, conflict of personal values as well as conflict between organizational goals and social goals (Kabeyi, 20018).A dilemma therefore whenever the consultant faces a choice between two or more options that have various consequences on the commissioner, consultant himself, organization and the project/programme beneficiary, donor or other stakeholders. Ethical dilemmas involve making decisions in an environment where rules a vague or in conflict while the outcome of an ethical decision cannot be predicted with certainty as to whether a decision made is right or wrong and quite often mistakes are made (Fernando, 2012). Valini (2007) recommended that for a consultant to uphold ethical standards and requirements in the course of evaluation, he should do the following;

- i.) the consultant should not accept a job from a commissioner where he is sure that it will force him to act unethically
- ii.) Accept a job only if you are able to perform it
- iii.) Only give opinions on decisions when you are sure that it is a correct solution and that it will help the commissioner or client
- iv.) Opinions given by a consultant should never be motivated by personal interests
- v.) Any solution or opinion given by the consultant should highlight risks involved to the client
- vi.) Suggested solutions or opinions should indicate the effect to third parties including the environment.
- vii.) All information accessed by the consultant in the cause of consultancy should be handled with confidentiality and should not be used or given for any other use without authority from third parties.
- viii.) Consultants should not consult for competing clients without authority or declaration.
- ix.) Consultants should always declare any conflict of interest during their evaluation work.

9.0. EVALUATION REPORT

An evaluation report is an important product of project evaluation process whose main function is to give a transparent framework for accountability for obtained results that is needed to make necessary decisions on the project or program being evaluated. The overall result of this is enable development of lessons learnt and hence enable improvement (UNDP, n.d). Evaluation reports vary greatly from one another based on the purpose, needs for evaluation, expectations and budget provided (Miron, 2004). An evaluation report forms basis for decision making. According to USAID (2012) the most important outcome and use of an evaluation to guide decision making and aimed at improving projects and programs. A well-written, valuation report that clearly provides credible findings and conclusions is desirable. An evaluation report is prepared by the consultant or evaluator to document what he did and what he found out. The reports should be easily accessed and quickly by interested or targeted stakeholders. It serves as a record of the status as at the time of evaluation and so acts as a means of comparison between the current and future evaluations when they are carried out. It is through an evaluation report that the evaluator can give written account or summary of the evaluation exercise and findings to stakeholders and other interested parties.

The primary responsibility for preparing the evaluation report rests with the evaluation consultant or the leader of the evaluation team. The commissioner and evaluated can also contribute to the report with their inputs. Important stakeholders need be involved in draft report review to check for any relevant factual errors or omissions, and to highlight any areas that they consider as inaccurate which ought to be accepted by evaluators although to safeguard the independence, they should be free to make own conclusions from the findings. For compliance with the criteria stated, a quality assurance and enhancement system may be put in place (UNDP, n.d).

9.1. Evaluation Report outline

The specific outline of an evaluation report may vary from one evaluation to another. However Miron (2004; UNDP (n.d), and USAID (2012) recommend the following outline of a typical evaluation report;

i.) **Title page of the report**

Title of the evaluation may include a clear reference number, Links to the evaluation plan, with information on strategic value, national involvement and alignment, timing, resources and financing, outcomes and the Strategic plan priorities, geographical coverage of the evaluation, name and organization of the evaluators and information in annex for assessment of competence and trustworthiness, name of the commissioning organization, date of evaluation report, expected actions from the evaluation and dates for action, dates for stakeholder meetings and status of meetings and name of contact point for the evaluation

ii.) **List of acronyms and abbreviations and operational definition of terms**

In these sections, the evaluator or consultants presents the various signs, acronyms and abbreviation used in his report for easy understanding by the readers of the evaluation reports. Operational terms can also be defined under definition of terms

iii.) **Table of contents including list of acronyms**

The table of contents is a section that is used to show what the report contains as outlook with section numbers and pages where each part is found. It facilitates easy sorting of information and selective reading of the report based on what the reader is looking for.

iv.) **Executive summary**

This may contain brief description of the project, evaluation purpose, questions and scope of evaluation, key findings, conclusions and key recommendations. The executive summary should not include information that is not mentioned and substantiated in the main report. Therefore executive summary is just the contents in brief.

v.) **Introduction: Background and context of project or program**

The introduction part of the evaluation report provides a brief purpose of evaluation, evaluation question if not covered in methodology, description of program or project, phenomena being evaluated including goals and history. The depth of information or details depends on whether or not the same is provided in another section of the report. Review of related literature is also highlighted in introduction and background of the report.

vi.) **Description of initiative or program**

In this section of the report, the consultant or evaluator describes the project or program and what it seeks to achieve. Deliverables and timelines of the project or program being evaluated are presented. This forms basis of evaluation by specifying or indicating what is key in the project or program.

vii.) **Objective or purpose of the project/program evaluation.**

This may contain the reason(s) why the evaluation is being conducted should be explicitly stated, justification for conducting the evaluation at this point in time should be summarized. Also details of who requires the evaluative information should be made clear

and description of context to provide an understanding of the geographic, socioeconomic, political and cultural settings in which the evaluation took place.

viii.) Research questions with scope of evaluation exercise stating limitations and delimitations

The research question may be developed by the commissioner, consultant/evaluator or jointly developed based on the purpose of the evaluation. The research question forms basis of data collection as the evaluator seeks for answers to the question through appropriate data collection instruments.

ix.) Research methodology or approach used in the evaluation exercise.

To be presented in this section include data needed to answer the questions and the sources of this data, sampling procedure applied to ensure e.g. area and population to be represented, rationale for selection, mechanics of selection, numbers selected out of potential subjects, limitations to sampling, procedures applied including triangulation to ensure the accuracy and reliability of the information collected, bases for making judgements and interpretation of the findings including performance indicators or levels of statistical significance as warranted by available data, description of procedures for quantitative and qualitative analyses. Innovations in methodological approach and added value to development evaluation, how the evaluation addressed equity in its design and in the provision of differentiated information to guide policies and programmes and how a human development and human rights perspective guided the evaluation and influenced the scope of the evaluation.

x.) Research or evaluation findings/results

In this section of the report, the evaluator presents findings of the evaluation clearly and logically. The results may be presented using descriptive statistics. Tables, charts, graphs that are well labelled and interpreted may be used.

xi.) Discussion including summary, explanation of findings and results interpretation.

In this section, the evaluator summarizes his findings and explains gives explanation of the results. The results are discussed and interpreted. The evaluator or consultant then makes his judgment or opinion about the program that covers merit and worth fairly based on presented results.

xii.) Conclusions

These are the judgements made by the evaluators and should not repeat the findings but address the key issues that can be abstracted from them. Conclusions are made based on an agreed basis for making judgments of value or worth relative to relevance, effectiveness, efficiency, sustainability of a project or programme. They address issues of relevance and significance to the subject being evaluated, determined by the evaluation objectives and the project evaluation questions being pursued.

xiii.) Recommendations and lessons learnt

Evaluation recommendations are derived and presented logically from the evaluation's findings and conclusions. Recommendations ought to be relevant to the evaluation and decisions to be made based on the evaluation exercise. They should be presented in a clear and concise manner and in order of priority. Recommendations should be supported by specific findings of the evaluation. Recommendations given should action-oriented, specific, practical, and indicate responsibility for action.

xiv.) Acknowledgements

In this section, the evaluator recognizes all who assisted him or made his evaluation possible and may include the data collectors or research assistants and commissioner or his/her entire team. The evaluator should be guided by research ethics to avoid any breach of trust or causing discomfort where confidentiality may be required.

xv.) References

In this section of the report, the evaluator or consultant lists the relevant literature cited in his report. The evaluator uses a suitable citation style like American Psychological Association (APA) is used consistently and all in text citations should show in references.

xvi.) Appendices/annexes to the report

They include original terms of reference, data collection instruments, data and data analysis, evaluation plan and other relevant documents related to the evaluation.

9.2. Qualities/characteristics of a good evaluation report

i.) Utility criteria

- a.) The report should serve the purpose of evaluation by providing complete information to all stakeholders. These can only be realized through adequate stakeholder involvement or participation, maintenance of evaluator or institutional credibility, alignment of evaluation process with institutional, available of adequate budget and time.
- b.) Recommendations should be specific, clear and actionable.
- c.) The report should provide details of expected follow-up actions by stakeholders.
- d.) The report presentation should of evaluation process and results should be exhaustive and well-structured for easy access and retrieval for action by stakeholders.

ii.) Credibility Criteria

- a.) The evaluation report will be credible if evaluation procedure and instruments are valid and reliable. For this to happen, the evaluators or consultants must be competent professionals and look or appear valid in opinion of users/stakeholders
- b.) The basis for making observations and judgments ought to be transparent and based on negotiated agreements between evaluator and evaluated.

iii.) Relevance, appropriateness and added-value

This criterion is met if information provided addresses organizational or project priorities, information needs and does not duplicate other information already available and is also relevant to the project and organizational goals.

10.0. CHALLENGES OF CONSULTANCY IN MONITORING AND EVALUATION

There are a number of challenges that are associated with consultancy. Aceved, Rivera, Lima. & Hwang (2010); Mitchel (1994); Rahman (2015) identified a number of challenges with using consultants in project and program evaluation.

- i.) Evaluation is often considered secondary to project planning and implementation and does not receive adequate funding during resource allocations and most effort is made in planning, launching and executing projects with little or no room for evaluation and change if needed making improvement orders not feasible. This creates sufficient for conflict between consultants or evaluators and the project execution team.
- ii.) Tendency of consultants to make reports and recommendations that are pleasing to the commissioner as appointing authority hence risk independence and objectivity.
- iii.) In case of joint evaluations with teams or other stakeholders, building consensus can be costly and time consuming process.
- iv.) A consultant being external to the project or program may miss important information and facts necessary to make reliable and credible reports and recommendation needed to improve the project or program.
- v.) The process of procuring evaluation consultants can consume significant resources in terms of personnel, time and money but with no guarantee of successful results.
- vi.) Whereas consultants are professionals expected to have a high degree of confidentiality and trust, engaging them exposes them to some data and information that may be considered highly confidential which has some degree of risk to the project or program in case of breach.
- vii.) Consultancy is performed by individual professional and quality in the services is heavily relies on these individuals who keep moving from one organization or firm of consultants to another making it difficult to guarantee quality and consistence in the work of consultants especially multiyear consultancies.
- viii.) Failure to correctly define the problem and evaluation question often leads to wrong or inaccurate data collection, misdiagnosis and wrong prescription leading to failure of the project or program.
- ix.) There is often lack of a theory of change for most projects which leaves a significant gap in design aspects of the project structure impacting negatively on ability to monitor, evaluate and report on project performance.

11.0. CONCLUSION

Evaluation is systematic, and objective analysis and assessment of the projects, programs, partnerships and procedures with respect to a given project or program. The process of evaluation provides the means to reflect and focus on performance and progress and the process involves assessment of policies and programs with the objective of improving learning and performance. There are various stakeholders in evaluation who have different interests e.g. the project manager, funders, beneficiaries, professionals that should be met. Therefore, evaluation process should involve some stakeholder analysis. Evaluation can be done by internal or external evaluators or both depending on prevailing circumstances and requirements, but generally an evaluation should have truthfulness, credibility (beauty), and justice as standards for the process. External evaluation is usually done by consultants. Evaluations should be guided by terms of reference.

Consultants play an important role in project evaluation and their use brings desired independence and professionalism in project evaluation. Terms of reference for monitoring evaluation provide an overall overview in terms of requirements and expectations of the evaluation undertaking. The terms of reference provide the objectives, roles, and responsibilities of the evaluator, the commissioner's expectations, other stakeholders and interests, and resources available for evaluation exercise. Terms of references are effective if they fulfill these functions. Terms of reference specify the working relationship between the evaluation and an external consultant or team of consultants, clarify scope, responsibilities, schedules, and budgets needed in the evaluation. Evaluators

should take care of the stakeholder interests and adequately address them during evaluation. An evaluation process should be followed by an objective evaluation report which will facilitate accountability, lessons learnt and improvement of the project or program being evaluated. The evaluators' reports should be relevant, credible and verifiable. Recommendations by the consultant should be presented in a manner that is clear, concise and in order of priority or weight. Recommendations made should be supported by specific findings from the evaluation. Evaluation is more successful in an environment of trust and positive working relationship between evaluators or consultants and commissioners as well as other stakeholders. The integrity of the consultants is critical, so ethics should be a guiding principle and consultants should stick to ethical standards and requirement during evaluation. Recommendations given should action-oriented, specific, practical, and indicate responsibility for implementation. The suggested recommendations should be implementable and their consequences should be declared by the evaluator.

12.0. RECOMMENDATIONS FOR SUCCESSFUL EVALUATION CONSULTANCY

There are several enablers of successful evaluation and consultancy. According to Lahey (2015); Mitchel (1994) the following factors acts can enhance performance of consultants;

i.) **Build Trust**

When stakeholders trust one another clients or their employees don't hold back information needed for fair evaluation.

ii.) **Maintain confidentiality within the organization.**

The risk of information 'leaks' is always greater at the client end of the relationship than the consultant's, therefore it is recommended to treat consultants with courtesy.

iii.) **Consultants should be paid well and in time.**

Late payment destroys client-consultancy relationship. Consultants in general work on small margins and hence should be facilitated. Consultants may develop resentment of late fee payers leading to poor performance of the evaluation by consultants.

iv.) **Develop partnership between consultant and commissioner/client**

The consultant and the commissioner should work together and clearly define the problem and evaluation question for successful evaluation and correct results of evaluation.

v.) **Provide adequate funding for evaluation and consultancy**

Funding for evaluation of projects and programs whether conducted or by external technical experts- should be built into budgeting and costing associated with project activities.

vi.) **Carefully develop terms of reference**

Terms of reference (ToR) should be carefully crafted with the relevant objective and evaluation question but should always give room for changes whenever necessary or when fundamentals change during the process.

vii.) **Hire the best consultant possible**

Successful evaluation should be done by a qualified consultant properly source

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Automatic Strategy to Control Entire Villager's Water Valves with User Level Authentication

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Abstract- Water is the basic needs of the humans. So it should be supplied controllably and at the appropriate time to locality. The water supply system is a part of the rural and urban infrastructure, commercial and personal usage which must assure the continuity of the water distribution, water quality control and the monitoring. The traditional drinking water supply system is facing many problems related to filtration, pumping of water, distribution of water and testing of water. The major problems in water supply system are leakage or wastage of water. Majority of publics uses suction motors to suck water from main supply connection, which results decrease in water pressure. To overcome the above problems, an automated system has been proposed which enhances the water distribution, reduces wastage of water. In the modern years, in every field new technologies have been implemented which is found to be efficient, simple to operate and also user friendly. So keeping all these factors in mind this work develops and proposes an embedded/microcontroller based remote controlled water supply system, namely, "automatic strategy to control entire villager's water valves with user level authentication". This work can be used in municipalities, agricultural field, and can also afforded in the industries according to their need.

Index Terms- Water Distribution, Pumping Station, Valve, Controlled water, Microcontroller.

I. INTRODUCTION

Water is very important to all the humans and to the plants, trees, animals and industries, etc. [6, 11]. In existing system, in rural and urban area, water is supplied to the home with the help of man power. The person in charge will go to the valve point and then opens it for Particular Street for certain fixed time. Once the time is over the person will go again to that place and close the valve. This is a waste of time, man power and also water wastage if the operator does not closes valve within stipulated time. Also, the people may take excess water for their personal use with the help of motor or some other equipment. Due to this many needy people will not receive required amount of water for their usage. Conventional water supply system comprises two different sections: First one is the pumping station- which performs the sucking of water from water source and the other is the distribution section- through which water is distributed to all the municipal wards. Currently these two sections are working independently. The use of water diversity increases because of restriction imposed

by the water availability, hydrological conditions, storage capability of tank, control and process parameters. The system includes pumping stations, storage tanks, piping distribution network and central dispatching unit. With the continuous economic growth, the water demand of enterprises is also increasing. The monitoring of water resource for these enterprises can prevent the occurrence of water stealing and water leaking effectively. Therefore, the monitoring system of urban and rural water supply has aroused extensive attention in recent years. The theft can be prevented only when any public inform the officials about the theft. But the possibility of public to inform the concerned higher officers are very rare. So the theft prevention or one who does the theft is difficult to identify in the early methods. Water scarcity is one of the major problems facing major cities of the world and wastage during transmission has been identified as a major due to waste of water at the time of pumping into overhead tanks [7]. To overcome the above problems, i.e. to supply the water equally to each house and to stop the water theft practice, an automated system using embedded controller has been proposed which enhances water distribution and reduces the wastage of water. A survey is also presented to focus on an identified ways to increase the performance and monitoring for the water distribution system.

A. LITERATURE REVIEW

The work proposed in [1], on design and development of automatic water level control system of software and hardware architecture combined together for the interfacing purposes. The system employs advance sensing technology to detect the water level using Arduino and relay to control the motor. The research work in [2] presented a system of automatic water level controller with SMS notification. The program was developed in Arduino program environment and loaded to the Microcontroller. This system avoids the manpower required for daily filling of the tank and checking for overflow. The research work in [3], emphasized on the need of water level controller in agriculture irrigation system. Every crop requires different amount of water and this can be achieved by using automatic water level controller- which also help in reducing wastage of water. Hall Effect Sensor (G1/2) is used to measure flow rate in irrigation pipelines whose speed of rotation changes with the different rate of flow of water. The authors in [4], proposed a microcontroller based drip irrigation system capable to provide irrigation to larger areas of plants with less water consumption and lower pressure. Using this, one can save manpower and water with improved production and profit.

Microcontroller chip Technology [5] - This is an on-chip computer- programmed to perform any control, sequencing, monitoring and display the function. Its great advantage is no other external compounds are needed for its application because all necessary peripherals are already built into it. Thus, we can save the time, space and cost which is needed to construct low cost device.

A GSM based Zigbee controlled solenoid valve for drip irrigation system was proposed in [6], which monitors and controls all the activities of drip irrigation efficiency and results in saving of manpower, water and the power consumption. The research work in [7], development and implemented an embedded system namely, an automatic water pump controller. This system uses microcontroller to automate the process of water pumping in an overhead tank, detects the water level in a tank and also switch on/off the pump accordingly and display the status. A literature review on embedded system based automatic water distribution monitoring system is presented in [8]. Distribution of water in every house within different areas needs the control and monitor for avoiding the water wastage and the water theft practices. Various technologies have been used to distribute/supply the water to all houses of residential areas. Arduino [9] is an open source prototyping platform based on easy-to-use hardware and software. One can train the board what to do by sending a set of instructions to the microcontroller on the board. The system in [10] operates automatically according to required irrigation sub areas to realize graded and constant pressure irrigation which enhances irrigation uniformity with saving the water and energy besides protecting the water pumps and pipeline system. The work in [11, 12] proposed a microcontroller based automatic plant irrigation system which helps in saving money and water. The system is controlled by microcontroller which is giving the interrupt signal to the sprinkler/motor. Temperature sensor and humidity sensor are connected to internal ports of micro controller via comparator.

Now, in the modern years in every field, new technologies have been implemented which is found to be efficient, simple to operate and also user friendly. So, keeping all these factors in

mind, this work proposes an embedded based water supply control system namely, "an automatic strategy to control entire villager's water valves with user level authentication". This work is a microcontroller based, can be used in municipalities, agricultural field, and can also afforded in the industries according to their need.

II. OBJECTIVES OF THE PROPOSED WORK

There are some objectives need to be achieved in order to accomplish this proposed work. These objectives will act as a guide and will restrict the system to be implemented for certain applications:

- Study the current technology used for supply water to the streets of locality.
- Design and develop automatic control system to control water flow based on Water requirement for the streets.
- Design and develop control circuit for the uniform water distribution.
- To achieve overall automation in the public water supply system which is an efficient.

III. PROPOSED METHODOLOGY

The system proposed shown in figure 3.1 is developed by using microcontroller based program. To build proposed model two AC motors have been used and a tank for collecting water in which three water level sensors are attached on the wall to sense water level. The ac source which is used in this system is to supply continuous power to the microcontroller unit for its operation. With the rapid development of global mobile system infrastructure, information and communication technology in the past few decades has made the communication more efficient and reliable for transmitting and receiving information. So here we used RF modem for efficient communication purpose.

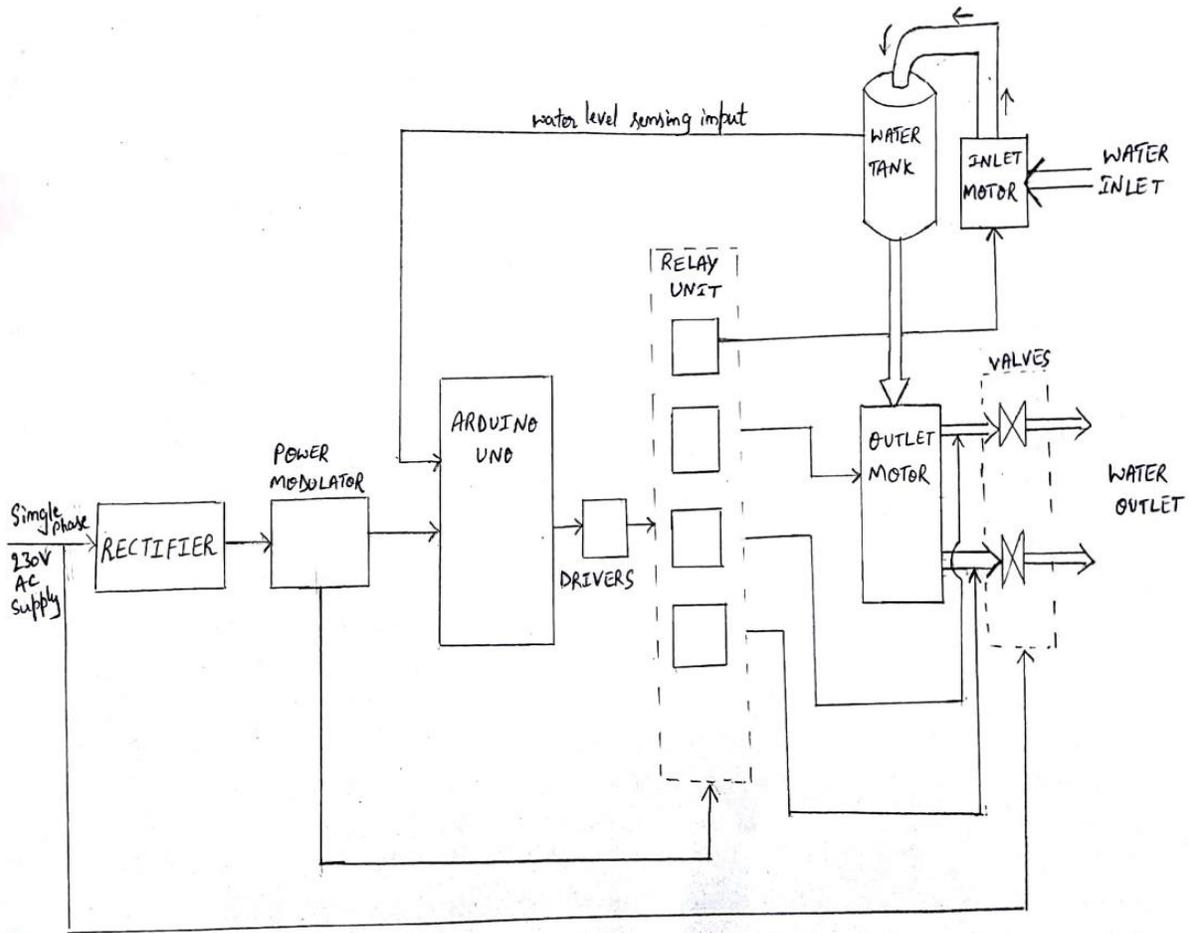


Fig. 3.1 Block Diagram of proposed system

A. Block Diagram

The block diagram of the proposed work is as shown in fig. 3.1 consists of rectifier, power modulator, arduino, driver circuit, relay unit, inlet motor, water tank, valve, etc.

B. Functional Block Diagram

Figure 3.2 gives the functional block diagram of the proposed system.

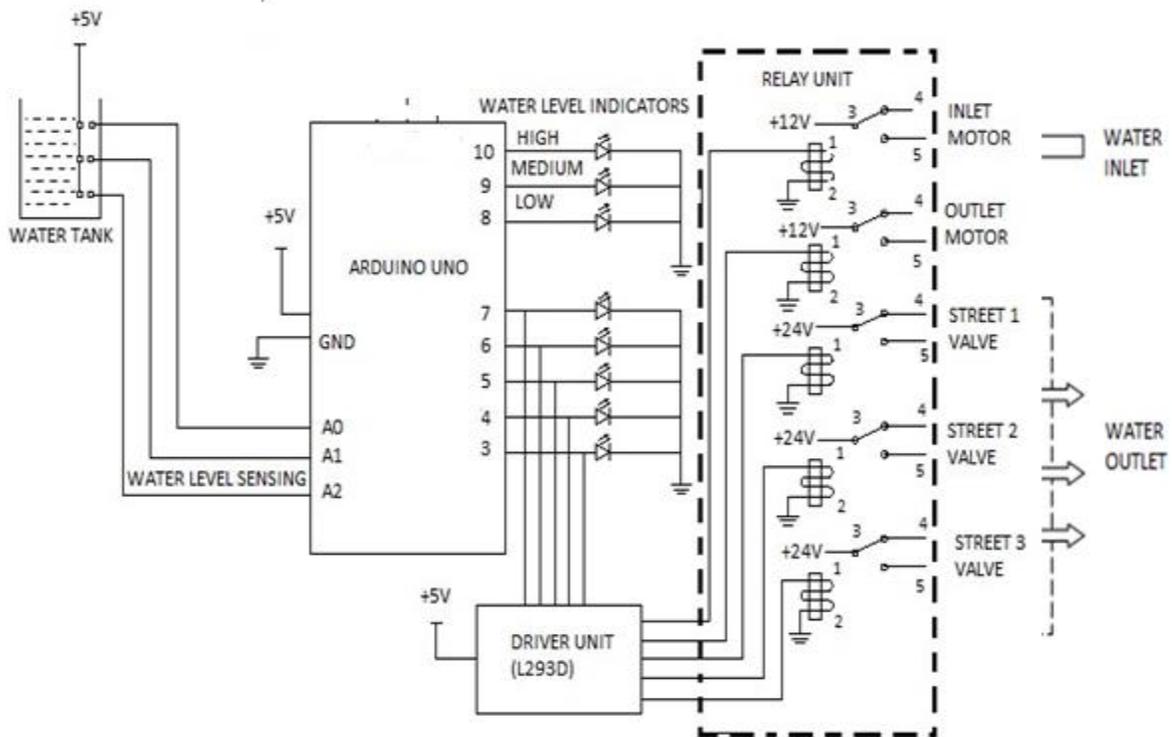


Fig. 3.2: Functional Block Diagram

C. Working Principle

The available single phase AC supply is rectified and supplied to power modulator. Power modulator contain individual regulator IC'S to obtain different voltage levels to drive Motor, RF Transmitter, Arduino, etc. Once the program is set and supply is given, the microcontroller starts processing and that gives signal to the driver circuit. Here the relay is energised by DC supply and this relay is normally open. When the micro controller pin became high according to the programming in addition to water level condition it will give the positively high (+5V) to L293D. L293D will provide the energizing supply to relay unit according to pulse received by Arduino pins.

The main work in this proposed work is carried by two AC Motors.

Inlet motor

The job of inlet motor is that it draws water from the available source like lakes, rivers, or from a well to the tank. Inside the tank, 3 water level sensor are attached so that when the water in the tank gets filled up completely, the sensor senses and it gives signal to the microcontroller so as to stop the inlet motor. Likewise, when the level of water is low in tank the motor is made to start automatically.

Outlet motor

It continuously draws water from the tank and feed water to the different streets through solenoid gate valves. There will be

three valves to control the water supply to public using solenoid valves.

Let us assume that we need to supply water for a particular street for 10 (timing can be changed according to the requirements) minutes that is predefined in the program. So for that duration the first valve gets open and it is open for particular pre-defined time and water is supplied. After a pre-set time, it is programmed in such a way that it must close automatically and thereafter simultaneously second gate valve is opened and it supplies for a pre-set time to the other different street that defined earlier on a program. Similarly, water is supplied to Next Street. Now if there is power failure during the water supply, say for about half an hour, this scheme is designed in such a way that when the power is restored, whatever the time is remaining to complete the pre-set time, gate valve will open to that duration and get closed after completing the remaining time and then only the second gate valve opens if necessary. This is one of the major advantages of this system. In addition to this, every change over occur in supplying water to different area the system, this message will passed to water supply board authority/operator by using RF Transmitter module.

D. Flow Chart

Figure 3.4 gives the flow chart for the proposed automatic water supply control System.

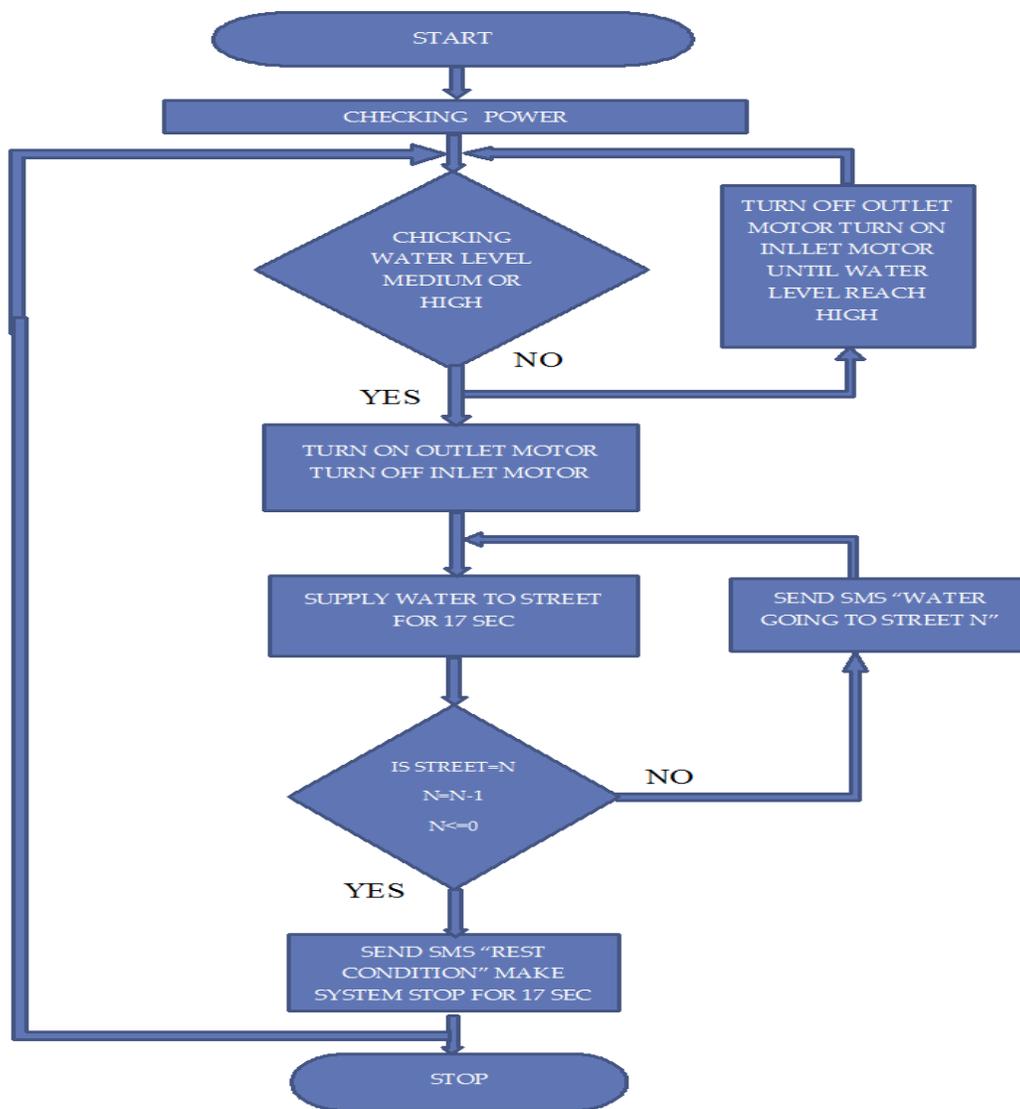


Fig. 3.4: Flow chart for the proposed automatic water supply control System

IV. RESULTS AND DISCUSSION

The proposed automatic public water supply control system has been tested and it is working satisfactorily. All the components of the system found to be working appropriately. Water supplied to all streets with predefined time in a proper controlled and efficient manner and is achieved successfully. The two AC motors are operating automatically when water reaches to medium level and water going to all street through solenoid valve. If there is any power failure at the time of operation, on chip timer will be continued until power restore and RF transmitter sends message automatically regarding which area is getting water. This work if implemented in municipalities it will minimize the man power, equal distribution of water without wastage and it also helps to minimise the over usage of water.

A. Advantages of Proposed Water Supply Scheme

- In this system water is not stagnate in pipe at any instant and hence fresh water is available always

- Lesser pipe sizes are required.
- Relatively cheaper.
- Determination of discharge and pressure is easier due to less number of valves.
- Water is kept in good circulation due to the absence of dead end.
- In the case of break down in some section, water is available from some other direction.

B. Applications

- Utilized for domestic and irrigation purpose.
- For household automation system.
- This work can also be used in municipalities, agricultural field, and can also afforded in the industries according to their need.

V. CONCLUSIONS AND SCOPE FOR FUTURE WORK

A. Conclusions

This work entitled, “Automatic strategy to control entire villager’s water valves with user level authentication”, is successfully developed, tested and is found to be working satisfactory. It has a very good feature when compared with the existing controller. This system distributes water equally and continuously with reduced cost of the water supply system. Since the system is based on microcontroller and GSM, the functioning is fast, easy and accurate.

B. Scope for future Work

- In this project, the GSM is used to send messages and alert the operator. For future improvement it can be used to control the entire operation of the water supply system.
- By adopting pressure sensor it can detect any leakage in pipe and intimate to the operator.
- Using some suitable sensors, this work can be applicable for irrigation purpose such as: moisture sensors, temperature sensors, etc.

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Comparison of Purse String Versus Conventional Closure of Ileostomy Skin Wounds

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Abstract- Background- Ileostomy closure is common surgical procedure done in most center across the globe. The aim of the study was to compare the purse string (PS) versus conventional linear closure (CLC) of ileostomy skin wounds in the incidence of Surgical Site Infection (SSI) following the stoma reversal. The secondary aim was to compare the cosmetic outcome following the two techniques, and also to identify other factors (such as duration of the operation and the postoperative stay, medication and complications) that might affect wound healing.

Methodology- An open, single center randomized controlled study was conducted at P.G.I.M.E.R., Dr. R.M.L. Hospital, New Delhi from November 2014 to January 2016. A total 31 cases were enrolled and divided into two groups according to the stoma closure technique: PS group (n=16) and the CLC group (n=15). Short-term outcomes were tabulated including surgical site infection and long-term outcomes were compared with patient satisfaction scale.

Result- SSI occurred in 5 of 31 patients (16.13%) and was more frequent in the CLC group than in the PS group (5/15 = 33.33% vs. 0/16 = 0%, P=0.018). The mean patient satisfaction score was higher in the purse string group 20 (range, 14-24) vs. the conventional linear closure group 16.9 (range, 13-21), P>0.05. The mean value of healing time for PS group is 23.94 days and for CLC group is 25.13 days (p>0.05).

Conclusion- Based on this study PS closure of ileostomy showed comparable outcomes in term of wound infection rate to those of CLC, however in terms of cosmesis there was greater patient satisfaction. Thus PS closure could be a good alternative to CLC.

Index Terms- stoma reversal, surgical site infection, purse string, patient satisfaction

I. INTRODUCTION

Ileostomy is derived from two Greek words, *eilos* (twisted bowel)¹ and *stoma* (mouth)², literally translated to mean a hole in the twisted part of the bowel, i.e. the ileum. [An ileostomy is](#) a procedure in which the small intestine is fixed to the anterior wall of the abdomen so that the digestive waste bypasses the large intestine and exits the body through an opening created artificially called as a stoma. Depending upon the reason for the surgery, it may be temporary or permanent. A stoma can be created to provide diversion to intestine contents for both emergency and elective procedures.

Ileostomy closure is a synonym for ileostomy reversal or ileostomy takedown procedure. These terms imply that the patient with a stoma still has a complete digestive tract that can be restored to its original shape and function.

Morbidity in a patient after ileostomy closure is, however, not negligible, with the most common complication being surgical site infection (SSI)^[35], having a reported incidence ranging from 0 to 41 percent^{3,4,5}. This morbidity on individual patients leads to a slower return to normal day to day activity and can result in significantly increased costs for healthcare providers, including extra stay in hospital, increased use of antibiotics and other products, and added nursing costs in the society. PS was found to be better for reducing incidence of SSI.^{6,7}

Banerjee⁸ described a method of wound closure after ileostomy take down that appeared to have a lower SSI rate as compared to the conventional linear closure. Sutton et al refined this method and performed a short series of successful SSI-free closure.

Banerjee's method, was coined as the 'purse-string' closure, which involves mobilizing the stoma by making an incision at the mucocutaneous junction around its whole circumference. The stoma is then released from the subcutaneous fat and fascia layers, closed and returned into the abdomen. The fascial layer is closed and a purse-string suture is then taken in the subcutaneous layer, and approximation done. The resulting small defect in the skin is left open which can be loosely packed with a gauze. If a non-absorbable suture is used, then it needs to be removed approximately 2 weeks after reversal. The purse-string technique therefore is a combination of the concept of leaving the wound open to provide drainage and minimize SSI, while at the same time providing wound apposition to decrease the time for healing of wound.

Reid et al.⁹ reported that a randomized prospective study done on 61 patients who had undergone ileostomy reversal by dividing them into groups in which wound closure had been performed by conventional linear skin closure (n = 31) and those in which purse-string skin closure had been performed (n = 30). In the purse-string skin closure group, SSI was 6.7% (2 cases), which was significantly less as compared to those with the linear skin closure group (38.7%, 12 cases).

II. METHODS

All patients who came to RML Hospital for ileostomy reversal from November 2014 to January 16 were considered for

the study. Data for the study was collected after an informed consent by patients. The sample size was determined by using a mathematical formula for dichotomous variables according to proportion. The study was approved by the Ethics Committee of the hospital.

III. OPERATIVE TECHNIQUE

As the *linear skin closure* technique, an elliptical incision was made around the ileostomy, and after releasing the ileostomy from the abdominal wall, a simple closure, resection and hand-sewn end-to-end anastomosis, or a resection and stapled side-to-side anastomosis was done depending on the choice of the surgeon. Afterwards, a layer-to-layer linear closure of the fascia of the rectus abdominis muscle, subcutaneous tissues, and the skin was done.

As the *purse-string skin closure* technique, a circumferential incision was made around the stoma, and adhesiolysis and anastomosis was performed as in the linear skin closure technique. Linear closure of the fascia of the rectus abdominis muscle was done. Subcutaneous tissues were closed. Purse-string suture was taken on the dermal layer with absorbable sutures and skin approximated.

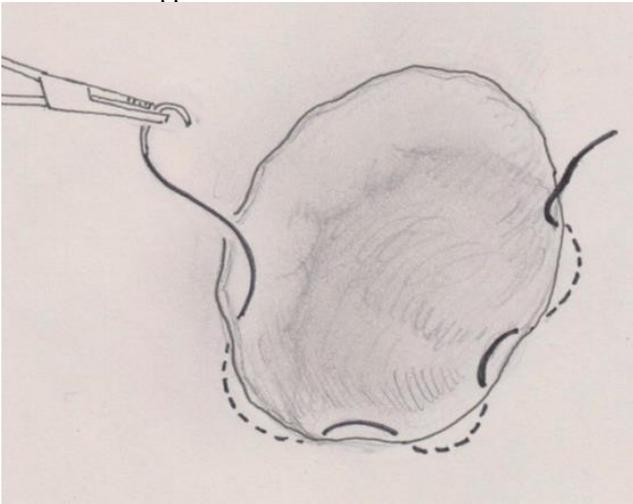


Figure 1: Illustration showing the operative procedure for the purse-string closure.

Short term variables:

- surgical site infection (SSI)
- purulent discharge
- culture
- signs & symptoms of infection

The incision site was assessed on day 1, day 3 and at the time of discharge by the surgeon at time of hospitalization, and after discharge patients were assessed in the surgery OPD on 10th day, 01 month and 03 months after the procedure.

Evidence of wound infection (cellulitis, induration, purulent discharge) was noted and if infection was present, wound was all opened in its full length at the bedside to allow it to drain and packed with sterile gauze daily until completely healed.

Wound cultures were not performed routinely and antibiotics were not routinely used. Dressing change was continued after discharge of patient at his/her home.

Long term variables:

To quantify the patient's satisfaction with their ileostomy site scar and overall wound healing, a scoring system was developed. Patients were contacted by phone and answers to a standard questionnaire noted. Factors which were assessed included patients' satisfaction with appearance of the scar, expectations regarding the scar, level of postoperative pain, time of wound healing, difficulty of wound care, and limitation of activity. A score of 1 to 5 was assigned for each factor, with the higher scores indicating better results.

Accordingly, an overall final score of 6 to 30 was possible, with 6 representing the worst outcome and 30 representing the best possible outcome.

Patients satisfaction:

Patient wound healing satisfaction scale which was on the basis of-

- a) Cosmetic aspect
- b) Patient's expectation
- c) Post- op pain
- d) Time of healing
- e) Wound care
- f) Return to normal activity

IV. STATISTICAL ANALYSIS

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean \pm SD and median. Normality of data was tested by Kolmogorov-Smirnov test. The non-parametric test was used when the normality was rejected.

Statistical tests were applied as follows-

1. Quantitative variables were compared using Unpaired t-test/Mann-Whitney Test (when the data sets were not normally distributed.) between the two groups.

2. Qualitative variables were compared using Chi-Square test /Fisher's exact test.

A p value of <0.05 was considered statistically significant.



Figure 2: Purse-string wound closure.



Figure 4: purse -string closure-10th day after closure of the ileostomy.



Figure 3: Purse-string final wound.



Figure 5: conventional linear closure- 10th day after closure of ileostomy.



Figure 6: purse-string closure- 3 month after closure of the ileostomy



Figure 7: conventional linear closure- 3 month after closure of the ileostomy.

Table II-Patient characteristics (n=31)-

[1] Characteristics	CLC (n=15)	PS (n=16)	P – value
Age, years	36.73(19-54)	36.75(19-57)	0.908
Sex			
Male:female	8:7	12:4	
Body mass index (kg/m ²)	23.27(15-30)	22.56(16-29)	0.552
ASA score			0.064
I	9	11	
II	2	5	
III	4	0	
Pre-operative albumin	4.07(3.4-4.9)	4.07(3.6-4.8)	0.977
Pre-operative co-morbidities			
Diabetes	2	0	0.226
Cardiovascular disease	0	0	
COPD	5	1	0.083
Steroid use	0	0	
Alcohol use	1	0	0.484
Smoking	3	4	1.000
Liver disease	0	0	

All the continuous variables are expressed as mean. CLC- conventional linear closure, PS- purse string, ASA-American Society of Anesthesiology, COPD- chronic obstructive pulmonary disease.

Table III-variation related to stoma closure-

Variable	CLC (n=15)	PS (n=16)	P-value
Mean time of primary surgery to stoma closure(days)	108.6(94-124)	104.75(94-119)	0.206
Mean duration of hospital stay (days)	5.53(4-8)	5.25(4-7)	0.464
Mean operative time (min)	101.33(70-144)	101.0(72-132)	0.812
Wound length (cm)	5.8(4-8)	0.59(0.5-1.0)	< 0.0005
Time of complete healing (days)	25.13(21-32)	23.94(19-32)	0.365
Surgical site infection	5(33.33%)	0	0.018

V. RESULTS-

Study comprised of 31 patients. Mean age of the patients was 36.74 years (range, 19 -57). 11 were female (35.48 %) and 20 (64.52 %) were male. Mean interval between creation of ileostomy and ileostomy closure was 106.68 days (range, 94 -124). Mean BMI at the time of ileostomy closure was 22.91 (range, 15-30). Mean duration of hospitalization was 5.39 days (range, 4-8).

Short term outcomes- CLC was performed in 15 patients (48.39 %) and PS in 16 (51.61%). There were total 15 patients in CLC group, out of which 5 patients (33.33 %) had SSI. There was no SSI found in PS group. The infection rate was statistically significant ($p = 0.018$) for both groups. Mean value of wound length (cm) for CLC group was 5.8 and 0.59 for PS group which was statistically significant ($p < 0.0005$). All wounds were healed at the time of second visit in the department. There were no statistically significant differences of age, sex, BMI, ASA score, operative time, duration of hospital stay, healing time, post-op complications and the time of primary surgery to stoma closure between PS and CLC group.

Long term outcomes-

21 out of the 31 (67.74 %) study patient completed the patient's satisfaction questionnaire. Mean values of satisfaction score for CLC group was 16.9 (range 13 to 21) and for group PS, it was 20 (14 to 24). PS group patients reported higher scores for all the questions. However, there was no statistically significant difference between the questions for both group ($p > 0.05$).

VI. DISCUSSION

Based on the method of closure technique used, the SSI rates varies from 0 % to 41 %. Primary linear closure, secondary delayed closure, and purse-string closure have been introduced as different methods for closure of stoma. In our randomized controlled trial, the SSI rate was 33.33% after CLC, and there was no incidence of SSI in the PS group.

Several studies have been reported on the rate of SSI following ileostomy closure with primary wound closure, partial wound closure, purse-string closure and open wound treatment for secondary healing^{3,5,10,11}.

In our study, there were no significant difference of age, sex, BMI, and American Society of Anesthesiology (ASA) scores.

In a retrospective study by, Marquez et al.¹² comparing primary closure with PSS, demonstrated a lower rate of SSI in the PSS group ($n = 17$) compared with the CLC group ($n = 61$). In contrast, in a retrospective study by, Vermulst et al.⁵ found no difference in the incidence of SSI following different skin-closure techniques. However, they analyzed the SSI rates following colostomy and ileostomy takedown, which to an extent limits the interpretation of the data⁵. Milanchi et al. published prospective, nonrandomized data comparing surgical site infection following different stoma-closure techniques and demonstrated SSI rates of 40% in a DS group and 0% in a PSS group¹¹. In 2010 a study by Reid et al.⁹ through a randomized controlled trial of 61 patients comparing PSS with DS gave results that were comparable with the findings of the present study with an SSI rate of 39% in the DS

group compared with 7% in the PSS group ($P = 0.005$)⁹. In a study by Sutton et al. there was no case of SSI in 52 patients, all of them underwent a PSS type of closure. The 7% infection rate in the PSS group in the study of Reid et al. may be due to a difference in the way of fashioning the PSS, with only a very small opening of few millimeters, remaining. Our concept is to leave an opening between 0.05 to 1.0 cm, which allows better drainage of fluid and more thorough showering postoperatively. In our randomized controlled trial, the SSI rate was 33.33 % after CLC, and no SSI occurred in the PS group.

Lee JR et al¹³ reported that, the median value of hospitalization period of the purse-string skin closure group was 7 days as compared to 11 days in conventional linear closure group, which was statistically significant ($p < 0.001$); nonetheless, it is difficult to consider it as being superior due to the difference in the wound closure techniques. Dusch N et al¹⁴ reported that, the mean length of post-operative hospital stay was similar in both groups (6.0 ± 4.1 days for the PS group vs 6.0 ± 3.4 days for the CLC group, $P = 0.40$). In our study, mean value of hospital stay (days) for CLC group is 5.53 and it was 5.25 for PS group which was statistically insignificant ($p = 0.46$).

Long term outcomes- On closing of skin with purse-string method, the long scars that are formed with conventional linear skin closure are avoided. Milanchi et al¹¹ reported that, mean patient satisfaction score was higher in the PS group (18.4, range 11 to 25) than the CLC group (15.9, range, 8 to 24, $p > 0.05$). Although individual factor scores were consistently higher in the PS group than CLC group. Patients were happier and satisfied in PS group, but the difference was statistically not significant. Dusch N et al¹⁴ reported that, there were no statistically significant differences in cosmetic outcome between the two groups. Wada et al¹⁵ reported a better cosmesis in PS group comparison to CLC group. Sang II Yoon¹⁶ reported that, according to result of questionnaire, PS group patients had higher score for all the questions. However, the only statistical difference was expectations regarding the scar ($p = 0.044$). In our study, 21 out of the 31 (67.74 %) patients completed the patient satisfaction questionnaire. Mean value of satisfaction scale for CLC group is 16.9 (range 13 to 21) and for group PS, it was 20 (range 14 to 24). PS group patients reported higher scores for all the questions. However, there was no statistical difference between the questions for both the groups ($p > 0.05$).

VII. CONCLUSION

The following conclusions were drawn:

1. Purse-string closure of ileostomy skin wounds can eliminate the risk of wound infection.
2. There is no significantly difference between healing time in both methods (PS and CLC).
3. Little additional nursing care was needed for patients undergoing PS closure, and patients were satisfied after having purse-string closure.

From our study, it may be recommended that PS as a method for eliminating wound infection after ileostomy closure, and also emphasize its superior cosmetic results and higher patient satisfaction.

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The Role of Brand Image in Customer Satisfaction towards Commercial Bank of Butwal Sub-Metropolitan City

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Abstract- The purpose of the study was to investigate the role of customer satisfaction on brand image towards the commercial at Butwal Sub- Metropolitan city. The result of ANOVA and regression indicate the strong relationship between brand image and customer satisfaction. The survey was carried out using 305 respondents. This results also indicate that brand image of the commercial banks is highly concerned with the satisfaction level towards their customers.

I. INTRODUCTION

Marketing of the service firms mainly concern with making the relationship with their customer for making strong brand. Strong brand plays the role of firm most valuable assets. It scores high priority on brand awareness where the firm tries to earn customer loyalty. Likewise, perceived brand value is directly correlated to customer assumption of service quality. For creating brand for any firms their employee also plays a crucial role in making perception, brand experience and customers relationship towards the firm. Branding of a product or service means creating the value in the mind of consumer through the legal procedures to create the brand name and offers differentiation. In this trending phase of marketing the name of maker may not matter much then the name of the product and service. While it may be argued that brand building is imperative in the highly competitive arena of financial services (Tomar, 2011).

According to Kotler and Armstrong, "Service is any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. It is the production process which may or may not be tied to the physical product". The service branding model does not differ in kind from that of products, only in degree. Berry said that the main difference in building brand equity for product compare to service is the great importance of service performance, meaning human performance for service rather than machine performance for products.

Brand image is an integral component of brand equity as it conveys the worth of the brand to the consumers. According to Kotler (2001) defined image as "the set of beliefs, ideas, and impression that a person holds regarding an object" (p. 273). So when we talk about brand image, it is about the mental representation of the brand based on individual or consumer's beliefs, ideas and impression. It is perceived differently by both consumers and organization. The way consumers or the target audience of the brand views or interprets is known as perceived image while the other is the desired image, which is the way company wants to position its brand matching the consumer's perceived image. Organizations make assumptions about the perceived image it is known as presumed image (Malik, Naeem, & Munawar, 2012).

Nepal Rastra Bank (NRB) regulates the national banking system and also functions as the government's central bank. As a regulator, NRB controls foreign exchange; supervises, monitors, and governs operations of banking and non-banking financial institutions; determines interest rates for commercial loans and deposits; and also determines exchange rates of foreign currencies. As the government's bank, NRB maintains all government income and expenditure accounts, issues Nepali bills and treasury notes, as well as loans to the government, and determines monetary policy (Embassy, 2019).

As of January 2018, there were 28 commercial banks in operation, including foreign joint-venture banks. A large number of development banks and finance companies have also been established. And there are 36 development banks and 25 finance companies in operation. Existing banking laws do not allow branch operation by any foreign banks. All commercial banks have correspondent banking arrangements with foreign commercial banks, which they use for transfers and payments (Embassy, Export.gov, 2019).

According to Keller (1993, 1998), brand image creates from perceptions of consumers about the brand associations, such as strength, uniqueness, favorability of a brand. Therefore, brand image occurs when the consumers hold some positive brand associations in memory and favorable response, in turn, can lead to enhance revenues, lower costs and greater benefits for the company (Linh, Yen, Tam, & et.al, 2017).

Banks have different characteristics compared to other commercial or trading companies because banks are financial intermediaries. Bank performance depends on trust and credibility of its customers. Its brand is different from brands of other companies providing non-bank products or services. Its brand image focuses on the overall assessment of customers to the bank, rather than an assessment of one or several products and services. The overall brand image is contributed by many factors related to the bank's structure and operations, reputation and personnel, building and developing its brand (Linh, Yen, Tam, & et.al, 2017).

II. PROBLEM STATEMENT

Customers have expectations and criteria when they judge whether the provided banking services is satisfactory or not. At the same time, due to the high competition in a banking sector, the perception of customers and potential customers are also divided according to the services that they want to achieve. The proper identification of customer satisfaction helps to retain customers and to increase brand awareness. In this phase of the financial service need to attract the customer with the help of their brand image (Man, 2017) .

III. RESEARCH OBJECTIVE

The main objective of this study is to identify the satisfaction level of the customer when it comes toward the brand image of commercial bank.

IV. LIMITATION OF THE STUDY

In this research paper only the commercial banks of the Nepal with reference to Butwal- sub metropolitan city is been used. All the data are based in the experience of the customer which somehow represents the biasness in the information because none of the loyal customer wants to talk bad about their bank.

V. LITERATURE REVIEW AND HYPOTHESIS

Brand Image

Brand image is the current view of the customers about a brand. The impressions consumers have of a company extend well beyond the product or service the firm provides. According to Porter, brand image is a mental image that reflects the way a brand is perceived, including all the identifying elements, the product or company personality, and the emotions and associations evoked in the consumer's mind. It can be defined as a unique bundle of associations within the minds of target customers. Keller defines brand image as perceptions about a brand as reflected by the brand associations held in consumer memory. It is a set of beliefs held about a specific brand. In short, it is nothing but the consumers' perception about the product. It is the manner in which a specific brand is positioned in the market (Linh, Yen, Tam, & et.al, 2017). Brand image conveys emotional value and not just a mental image. Brand image is a composite of perceived quality and esteem dimensions. In other words, brand image is a perception of a brand held in customer memory and reflecting a customer's overall impression. A positive brand image can be considered as a crucial ability of a corporation to hold its market position. A brand image of a bank is not absolute; it is relative to brand images of competing banks. The customers often form a brand image of a bank from their own banking experience. Furthermore, bank brand image possesses a strategic function. Through strategic marketing activities, the brand image of a bank can be used to help it improve its competitive position. Thus, a favorable bank brand image helps strengthen the intentions customers have for selecting a banks (Onyancha, 2013).

Customer satisfaction

Customer satisfaction has been gaining increasing attention from the researchers and practitioners as a recognized field of scholarly study and is a fundamental tool used by financial institutions for enhancing customer loyalty and ultimately organizational performance and profitability (Essays, 2018). The importance of customer satisfaction cannot be dismissed because happy customers are like free advertising. Many of us have heard of the current trend for businesses to become highly customer-centric, that is to put the customer at the centre of our business in terms of our strategies, actions and processes. For most of us, old truths still hold well, such as it is easier and more profitable to sell to existing customers than to find new ones. In practice, organizations are increasingly setting themselves strategies to measure and ensure customer retention, and charging their staff to be more customer focused and service-oriented (Mohsan, Nawaz, Shaukat, & et.al, 2011). Concept of customer satisfaction has a central position in marketing as it is a major outcome of marketing activity and it links the processes of purchase and consumption or use of the product or service to attitude change, repeat purchase and ultimately brand loyalty. Origin of the concept is related to the marketing concept that profit is generated through satisfaction of customer needs and wants. Business Dictionary defines Customer Satisfaction as: The degree of satisfaction provided by the goods or services of a company as measured by the number of repeat customers. Concept of customer satisfaction is new to many companies, who have been focused on price and availability of products (Sabir, Ghafoor, Akhtar, & et.al, 2014).

VI. CONCEPTUAL FRAMEWORK

In this conceptual framework brand image is the independent factor and customer satisfaction is the dependent variable.



Source: (Onyancha, 2013)

According to the (Onyancha, 2013) results reveal that bank brand image has positive effects on customer satisfaction and loyalty. It means that a positive bank brand image not only increases customer loyalty directly, but it also improves customer satisfaction

through the enhancing of perceived service quality, which in turn increases customer attraction towards banking sector. Bank brand image indeed serves as a lead factor in enhancing service quality, customer satisfaction, and loyalty. (Kariuki, 2015) Research has concluded that brand image and customer satisfaction has significant positive relationships. Likewise customer satisfaction is important in maintaining customers, particularly those in service industry. For customer satisfaction, banks should understand customer-specific needs, provide good quality service, and have the capacity to address customer complaints or problems in a friendly manner. Branding has become necessary due to the fact that the service sector is people oriented and living the brand have already become a rather well known expression. However to what extend is the banking industry for that matter committed to developing their people means of building the strength of the brand. There are several reasons why one needs to research the effectiveness of branding campaigns in the banking sector (Yeboah, Ewur, Adigbo, & et.al, 2014).

Research Hypothesis

The hypothesis designed for this page is based on the following assumption:

H1: There is positive relationship between brand image and customer satisfaction.

H10: There is negative relationship between brand image and customer satisfaction.

VII. RESEARCH METHOD

In customer satisfaction data collection, random sampling of bank customers could not be followed as banks did not provide customer databases. Selecting customers through any other method for random sampling would have been time consuming and costly. The sample size of customer is 384 with 95% confidence level. Hence convenient sampling was used. There are both primary and secondary source of data where questionnaire method is done for primary data. Customer satisfaction level was measured where question are distributed in personal details and other question which will help to find the satisfaction level of customer of commercial bank. Here all the personal details are been used only for academic purpose with full privacy of customers and employees information. The statistical tools used in this study were regression analysis to test the hypothesis. ANOVA was used to check the overall fitness of the model. The results of analysis are properly tabulated, analyzed and interpreted. Customer sample consist of 384 but out of them only 305 data can be collected. The respondents are those people who are the user of commercial banks. They are from their below twenty to above sixties. In below analysis table there will be the age wise, gender wise, education wise representation of the respondent. Bank customers belonging to different age, gender, education groups may have different attitude towards the image of their associated bank. Hence those items are considered as a demographic variable for the study to test whether the responses will satisfy or not. This study is conducted to find out whether the customers are satisfied with their associated bank and what they prefer from that bank.

Descriptive statistics

Table.1: Age wise customer respondents

Age Category	Percentage (%)
Below 20	10.8%
20-29	21.3%
30-39	25.2%
40-49	18.4%
50-59	17.4%
60 above	6.9%
Total	100%

This table shows that 30-39 age groups had 25.2% of the banks customers are satisfied by the brand image of the banks. Likewise, this ratio is followed by the age group of 20-29 with 21.3% satisfaction level and so on. This reason perhaps explains why these age groups dominate access to bank products and their brand service. Therefore, more sensitivity should be made to attract these groups with different brand services which will be attractive as well as satisfied their needs.

Table.2: Gender of the respondent

Category	Frequency	Percent	Valid Percent	Cumulative Percent
Male	128	41.2	42.0	42.0
Female	177	56.9	58.0	100.0
Total	305	98.1	100.0	

In this study conducted among the 384 respondent among them 305 respondent are able to respond. Total respondents are divided on the basis of gender. The group is male and female. The male numbers are 128 which refer to 42% and female number is 177 which refer to 58% of total respondent. It can be stated that the ratio of the women is higher than man which refers that female respondent are more likely attracted to the brand name of the bank.

Table.3: Education level of the respondents

Category	Frequency	Percent	Valid Percent	Cumulative Percent
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Less than 8	56	18.0	18.4	18.4
SLC	115	37.0	37.7	56.1
+2	67	21.5	22.0	78.0
Graduate	67	21.5	22.0	100.0
Total	305	98.1	100.0	

Above presented table show the educational qualification of the customer respondents. The majority of the respondents are of S.L.C level which is 37.7% and other qualification are those customer which education level is less than class 8 is 18.4% and so on. This refers that the lowest education level predicts that the concept brand image is not working with those level. Here, it shows that the respondent of SLC level education is most satisfied customer by the brand name of their associated bank.

Brand Image

Table 4: *Descriptive Analysis of Bank's Brand Image*

Indicators of Bank's Brand Image	Mean	Std. Deviation
i. Brand name of this bank tells me lot about what to expect from this bank.	3.16	1.406
ii. Brand name of this bank tells me all the latest information.	3.25	1.408
iii. The brand name of this bank means something to me.	3.42	1.333
iv. The brand name of this bank sends a message to me about the bank.	3.53	1.275
v. The brand name of this bank sends a message to me about the bank	3.30	1.405

Table 4 shows that customer are satisfied when the bank provide the information about the service and send every details about the change in the product/service with the mean score of 3.53. This statement is followed by how brand name of bank is connected with their emotions and so on.

Table 5: *Descriptive Analysis of Customer Satisfaction*

Indicators of Customer Satisfaction	Mean	Std. Deviation
i. I am very satisfied with the service provided by this bank.	3.34	1.303
ii. This bank does a good job of satisfying my needs.	3.28	1.299
iii. The service provided by this bank is very satisfactory.	3.31	1.402
iv. I believe that using this bank is usually a very satisfying experience.	3.48	1.377
v. I made the right decision when I decided to use this bank.	3.12	1.448

Likewise in Table 5 customer are satisfied with their experience from their associated bank with mean value of 3.48 and standard deviation of 1.377. Here customer satisfaction is linked with the service provided and they feel satisfied with the product/service provided by their bank.

Correlations between Bank's Brand Image and Customer Satisfaction

Table 6: *Analysis of Pearson correlation*

		Customer Satisfaction
Bank's Brand Image	Pearson Correlation	.286**
	Sig. (2-tailed)	.000
	Sum of Squares and Cross-products	105.131
	Covariance	.346
	N	305

** . Correlation is significant at the 0.01 level (2-tailed).

Pearson's correlation coefficient is the test statistics that measures the statistical relationship, or association, between two continuous variables. It is known as the best method of measuring the association between variables of interest because it is based on the method of covariance. It gives information about the magnitude of the association, or correlation, as well as the direction of the relationship

(Statistics Solutions). The value of the Pearson correlation is near to +1 which refers that if the brand image of the bank increase then customer satisfaction also increased.

ANOVA Test

Table 7: Analysis of ANOVA

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	33.726	1	33.726	54.859	.000 ^b
	Residual	186.280	303	.615		
	Total	220.007	304			

a. Dependent Variable: Customer satisfaction level

b. Predictors: (Constant), Bank's brand image

In these results, the null hypothesis states that the brand image is positive relation with customer satisfaction. Because the p-value is 0.000, which is less than the significance level of 0.05, you can reject the null hypothesis and conclude that brand image plays the significant role in customer satisfaction.

Table 8: Regression Analysis

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.018	.180		11.227	.000
Bank's brand image	.387	.052	.392	7.407	.000

a. Dependent Variable: Customer satisfaction level

We found that the model with the best fit with the dependent variable of customer satisfaction to their independent variable of brand name. By the analysis of the ANOVA and regression it interpret that brand image has positive relation in customer satisfaction.

VIII. CONCLUSION

The current study can be concluded in such manner that the strong relationship was found between customer satisfaction and brand image. Commercial banks of the Nepal mainly focus in their profit increment but in this study it suggests that they also should give more importance in their brand image. This research shows that the commercial banks of Nepal with reference to Butwal Sub-metropolitan city is significantly correlated with their brand image regarding the customer satisfaction.

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Trends in leather processing: A Review

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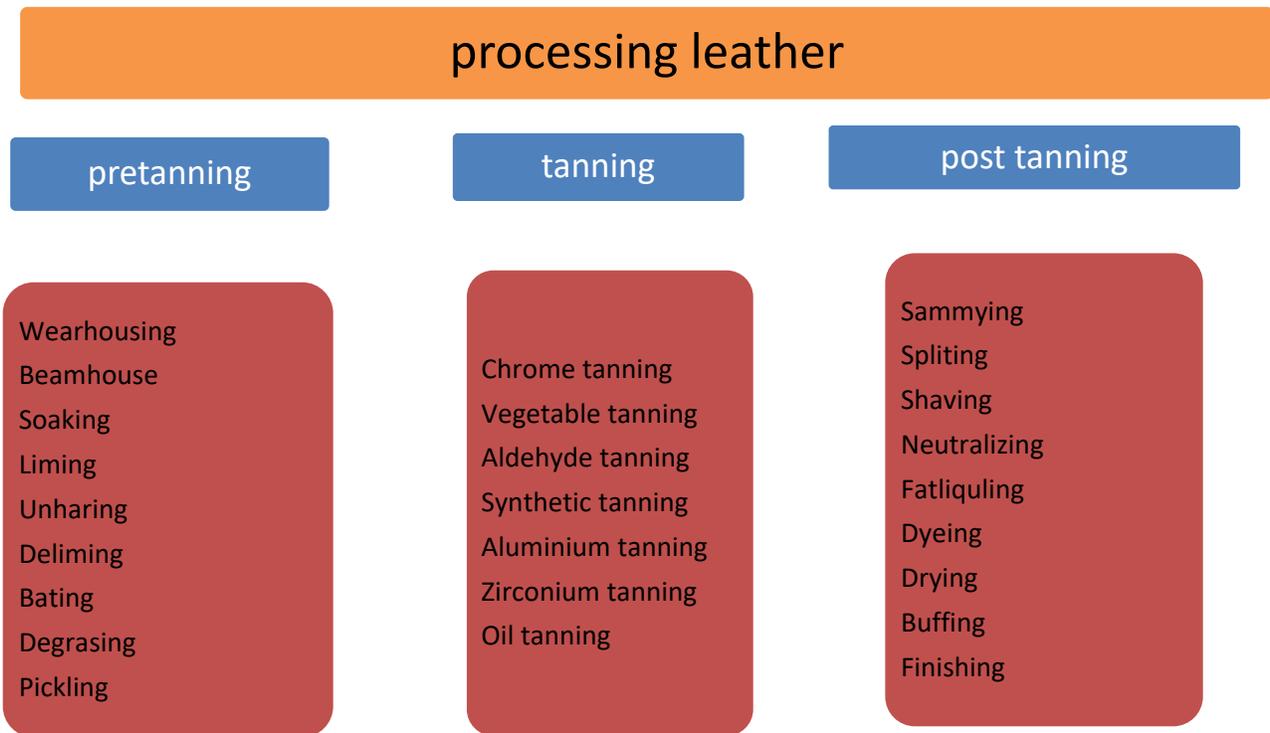
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Abstract- Tanning is the process by which raw skins and hides are converted to a durable and flexible material which is non-putrescible. Leather has good hydrothermal stability, good mechanical properties, and its resistance to chemical and biological degradation helps it to be used in various applications. Leather can be used for various purposes such as making of handbags, belts, clothing, small accessories and shoes, furniture, interior decoration. The leather industry gets its raw materials from hides and skins of cattle, camel, sheep and goat and also from exotic sources such as ostrich, rabbit, crocodiles and fish. Kenya having a good strong base for fish industry there is need to pursue the production of fish leather. Leather processing involves three sub stages; pretanning, tanning and post tanning and finishing. There are different types of tannage available depending on the quality of the leather need by the consumer. The types include mineral tanning include (chromium, aluminum, iron, zinc), vegetable tanning (mimosa, acacia, quebracho), aldehyde tanning (glutaldehyde, formaldehyde) and oil tanning. The range of physical properties determines the quality of product. Various physical, chemical and fastness properties are required from leather products depending on their field of use. New methods and technologies should be applied to reduce the ecological impact of leather production.

Index Terms- Tanning, Fish Leather, Hydrothermal Stability, Resistance, Properties

I. INTRODUCTION

Leather is a durable and a flexible material created by converting animal raw hide and skins [1]. It is created through a process known as tanning where the raw hide and skins are converted to non-putrescible material which resist bacterial attack, chemical degradation and resist mechanical deformation. The material gains hydrothermal stability, good breathability, durability, high strength among others characteristics[2]. The leather stability is attributed to the strong interlocking of the collagen fibers with the tanning agent which can either be organic or inorganic. The inorganic agent usually contains chromium salts which forms coordination complexes with the skin collagen enabling its biochemical stabilization[3]. Other inorganic salts used includes aluminium, zirconium, silicon and iron[4]. Organic tanning agents include vegetable tanning materials such as mimosa, different species of acacia, tara, oak quebracho among others. Vegetable tanning materials are considered less polluting than chromium but have a substantive high tensile and tearing strength, elongation, breathability and insulating properties and flexing endurance. Vegetable tanning involves treating the hide and skins with leaves and barks of trees containing tannins[5]. Other tanning agents include oil tanning[6], aldehyde tanning and synthetic tanning[7]. The processing of hide and skin involves different process and operations such as preservation stage, pretanning operations, tanning operations, post tanning and finishing to get the desired features of the leather [1].



Scheme.1 processing of leather

Preservation

Flayed skins and hides can be preserved through drying or salting. The aim is to dehydrate the skins to resistant putrefaction to allow their transport and storage. Preservation is done to destroy active bacteria, to prevent bacterial activity or to prevent bacterial contamination[8]. In sun-drying the interfibrillary substances coagulate and form some hard cementing substances which prevent the separation of fibres from each other, and thus make hide and skins difficult to soak back[9]. Sodium chloride curing system is the most popular animal skin preservation method adopted globally and this leads in the generation of large quantities of total dissolved solids. This has led tanners to search for better alternatives which are salt free and environmental friendly. The use of boric acid with little amount of sodium chloride salt is one of the alternatives as suggested by[10]. They achieved more than 80% reduction in chlorides and total dissolved solids in the effluents. Silica gel has also been used to preserve as reported by[10].

Soaking

This is the first step in leather processing. It is an operation which can be carried out in pits, paddles or drum[2]. The aim of soaking is to rehydrate the skin proteins which results to opening up of the fibers, remove curing salt in case of salted skin, clean off surface filth such as dirt, dung and blood stains. Small residual concentration of sodium chloride is still desirable in the process bath, as it helps diffusion of water down the hierarchical structure of skin fibres for easier rehydration. The removed salt can be recovered for other uses after a series of purification[10]. When the skin open up there is removal of non-collagenous skin components: the hyaluronic acid and other glycosaminoglycans,

the non-structural proteins, the fats and splitting the fibre structure at the level of the fibril bundles, to separate them[11].

Soaking operation should be done under certain conditions which include the float, temperature, pH, time and mechanical action. The soaking float is dependent on the condition of the skin in which the float can range from 200-300 % on the salted pelt. Green hides and skins are soft enough not require much soaking, but to remove the blood and dirt. Dried hides need more float for rehydration. Bactericidal agent can also be added to the float to prevent bacterial growth during the process. Since the raw material has a denaturation/ shrinkage temperature of about 65 ° C the temperatures should be limited to 30 ° C so as not to destroy the collagen. Soaking is carried out at PH values between 9 and 10 by addition of an alkaline which helps in the moderate swelling of the skins which in turn aids in rehydration[11]. In conventional batch soaking, salted hides usually require 6 hours or more to remove enough salt to ensure that the pelt is completely rehydrated in the center of the cross section and down the hierarchy of structure. Dried skins and hides require 24–48 hours or more. Increased mechanical action increases the rate of soaking of the material[12]. Controlled mechanical action is adopted since violent agitation destroys the fibres of the skin. Wetting agents aids in soaking and also enzymes have been adopted although make the final leather slightly empty therefore filling of leather is necessary in the post tanning process. A soaking method using proteolytic enzymes and carbohydrases in the pH range of 5.5 to 10 has been described by[13].

Liming and unhairing

The soaked skins are treated with milk of lime (calcium hydroxide) and additional sharpening agents like sulphides which aids in the removal of hairs, and other keratinous matter. Liming

loosens the collagen fibres and improve the flexibility and fullness of the leather. This process helps to swell up the pelt which contributes to the opening up of the fibre structure. Liming raises the pH to 12-13 in which it's a good environment for the hydrolysis of the amide side chains[14]. If the pH is lower, the unhairing chemistry does not work, because the equilibrium between the non-unhairing hydrosulfide ion and the unhairing sulfide ion is unfavorable. Liming also helps in the splitting of the fibre structure at the level of fibril bundles. This allows for better penetration of the chemicals and more effective reaction. Natural fats are partially saponified, most of the interfibrillar proteins such as albumins and globulins are eliminated, and mucoids are degraded[11].

The loosening of the hair is due the chemical action of the lime liquor on the hair root or base of the hair shaft. This weakening of the hair is dependent on the breakdown of the disulphide link of the amino acid, cystine, which is characteristic of the keratin class of proteins. Degradation reaction, which commences with sulfide attack at the disulfide bond, this is based on hydroxyl ion attack at the methylene group on the cystine side chain[11]. Hair saving method can also be adopted this process target the structure of the hair within the follicle, either the bulb or the prekeratinised zone. The effect is to ensure detachment of the hair from the base of the follicle. Use of enzymes in unhairing have been suggested with the aim of cleaner leather technology[15].

Fleshing

This is a mechanical operation which is done to the fresh side of the pelt to remove adhering fresh which was left after flaying. Fleshing is done manually for lighter pelts which a fleshing knife over the beam, for heavy pelts a fleshing machine is used to remove the fresh. Adequate fleshing allows the penetration of the chemicals in the subsequent processes. Green fleshing reduces the chemical uptake during liming and assists in achieving a uniform liming effect to enhance leather quality[15].

DE liming

The objective of this process is to remove from the limed pelt the lime and other alkalies, used in liming, either by repeated washing in water or by chemical treatment or by both. For surface lime it is removed by repeated washing with water but for combined lime it is removed with chemicals such as ammonium salts; ammonium chloride, ammonium sulphate, weak acids; boric acid, acetic acid. The reaction which takes place are as follows for ammonium chloride, ammonium sulphate and boric acid respectively[11].

1. $2\text{NH}_4\text{Cl} + \text{Ca}(\text{OH})_2 = \text{CaCl}_2 + 2\text{NH}_3 + 2\text{H}_2\text{O}$
2. $(\text{NH}_4)_2\text{SO}_4 + \text{Ca}(\text{OH})_2 = \text{CaSO}_4 + 2\text{NH}_3 + 2\text{H}_2\text{O}$
3. $3\text{Ca}(\text{OH})_2 + 2\text{H}_3\text{BO}_3 = \text{Ca}_3(\text{BO}_3)_2 + 6\text{H}_2\text{O}$

The use of carbon dioxide as a deliming agent has also been adopted in developed countries. The gas is sparingly soluble in water, producing acid that can neutralize the alkalinity of the limed pelt[16]. Completion of the deliming process is noted by cutting the pelt with a knife and using an indicator, usually phenolphthalein to determine the "lime streak" in the pelt in which absence of a pink color means complete deliming. Deliming adjusts pH from 12-12.5 to 8-9[11].

Bating

This process helps to make a finished leather which is smooth, flat, flexible, soft and stretchy[2]. It involves the addition of proteolytic enzymes. These proteolytic enzymes open the fibrous structure of the pelt to make it softer. Bating also removes the remaining lime in the pelt. Scuds are loosened and other unwanted proteins are removed and this increase the degree of stretch. Bating de-swells swollen pelts and prepares pelt for tanning. The process is performed at optimum temperatures for the enzymes 35-40 °C[11].

Degreasing

Degreasing process is carried out to eliminate the excess of natural fat substances from the skin. If the residue is not removed it can cause fatty acid spues, uneven dyeing and finishing, waxy patches in alum tanned leathers and pink stains in chrome tanned wet blue[17]. High amounts of fat can also cause hardness to touch and loss of physical strength. This process step is mainly part of sheepskin processing due to 30 to 40 % of fat substances output in respect to the raw weight. However, it is an essential operation in leather process to avoid quality loss. Organic solvents are employed as degreasing agents in the 2 to 3 hours lasting degreasing process. Palop and Marsal [18] studied the effectiveness of using lipase enzyme in the degreasing process. They observed that there is increase of the breakdown of the fats when the lipase was combined with protease in the process.

Pickling

The pickling process is primarily conducted to adjust the collagen to the conditions required by the tanning agent in tanning reaction. This process lowers the pH by addition of an acid and salt. The low pH end the bating process and improves the penetration of the subsequent tanning agent and prevents to prevent the rapid combination of the skin substrate with chromium compound [19]. The pickling agents normally used are 5- 10 % common salt or sodium sulphate, and 0.6-1.5% acids (sulphuric acid, hydrochloric acid, acetic or formic acid or mixtures). The function of the salt is to prevent acid swelling. The function of the acid is to acidify the collagen, to protonate the carboxyl groups where the reactivity is modified, because the chrome tanning reaction only involves ionized carboxyl groups. The acidic treatment minimizes the negative charge of the carboxyl groups and maximizes the positive charge of the amino groups of the collagen peptides thus making the pelt positively charged[20]. After this process the skin can be shipped or stored for long period of time without deteriorating. Due to the environmental problems which the salts cause, salt free pickling process has been adopted to reduce the total dissolved solids. Recycling and reuse of pickle liquor for the subsequent batches have been studied[21]. Li, Chen [20] proposed a pickling process to reduce or eliminate the use of neutral salts thereby avoiding the shortcomings of the traditional pickling process.

Tanning

This is the process which converts protein collagen of the raw hide into a stable material which does not putrefy[2]. In this process additional crosslinks are introduced into the collagen combining the active groups of the tanning agents to the functional group of the protein. The tanning effect largely depend on the

extent of the crosslinking between the collagen molecules and the thermodynamic stability of the crosslinking bonds. The stability is assessed by the determination of the shrinkage temperature of the leather. Satisfactory tanning effect is characterized by complete penetration and uniform distribution of the tanning materials[22]. There are several tanning methods and materials and the choice depends mainly on the properties required in the finished leather, the cost of the alternative materials, the plant available, and the type of raw material. Tanning may be done in many ways like mineral tanning (Chrome tanning, Alum tanning, Iron tanning, Zirconium tanning), Non-mineral tanning (Aldehyde tanning, vegetable tanning, Oil tanning, Resin tanning, Synthetic tanning, Combination tanning) which are discussed later in this paper. After tanning basification is done using sodium bicarbonate to increase the pH to favor the subsequent processes such as retanning dyeing and fatliquoring[23]. The basification process fixes the tanning material to the leather, and the more tanning material fixed, the higher the hydrothermal stability and increased shrinkage temperature resistance of the leather. The degree of tannage is determined by boil test or using shrinkage testing apparatus where each tannage has its shrinkage temperature. Chrome tanned leather have a shrinkage temperature above 100°C of as reported by Covington. Vegetable tanning have a shrinkage temperature of 80-85 °C depending on the various species of tannins as reported by Kuria, Ombui [5]. A research conducted by Shi, Li [24] indicated that wet white leather have a shrinkage temperature of 85 °C. Combination tannage increases the shrinkage temperature as reported by Valeika, Sirvaityte [25]. Masking is also done using masking agents such as sodium formate, sodium acetate, and sodium oxalate. Masking is the modification of metal complexes, by replacing aquo ligands with other less labile ligands. The purpose is to render the complex less susceptible to additional complexing reactions, including precipitation[11].

Neutralization

Chrome tanned and semi chrome leathers are piled up after basification. Even in overnight piling, the pH drops, indicating the liberation of acid. The source of this acid may be from ionization of neutral carboxyl's, ionization of positively charged amino ($-NH_3^+$) groups and hydrolysis of chrome itself[26]. Neutralization is an important procedure in making leather, the process removes acidity in the leather aiding in thorough and uniform penetration of dyes. Most of the dyes and fatliquor used are anionic if these negatively charged materials have to penetrate into collagenous fabric, then the collagen should also bear a net negative charge. Collagen becomes anionic when H^+ of the carboxyl and also of the positively charged amino (i.e. $-NH_3^+$) groups are removed by treatment with an alkali. The choice of materials and the control of neutralization degree will have a direct influence on dyeing, fat liquoring and filling. Sodium carbonate, sodium bicarbonate are agents which are used to facilitate neutralization[27]. The leather is neutralized to about a pH 5.4-6.5 [26].

Retanning

The purpose of this process is to modify the properties and performance of the leather. In Order to make the finished leather level out, full and elastic and avoid the possibility of loose grain it is necessary to use retanning and filling agents[27]. The objectives

are to fill the loose portions of the tanned leather, to achieve less shrinking during drying, to improve the penetration of anionic type fat liquors, dyestuffs and finish adhesion and to improve certain specific properties like perspiration resistance, fastness to washing, flammability. The retanning materials are taken into and interacting with the collagen matrix which constitutes the fibre structure in the leather. The interaction can be either chemical reaction, by coating the fibres or by filling the voids between the fibres[28]

The chemicals used are vegetable extracts, resins and syntans. Inorganic mineral substances (chrome, aluminium, zirconium salts) can also be used. Vegetable retanning improves the usable area and increases the thickness of the leather. Plants extracts such as acacia, quebracho, wattle, sumac, hemlock, oak, tara and commercially available mimosa are some of the vegetable extracts which are used in tanning[29]. Acrylic resins are widely used since they have a good selective filling property to improve the cutting value of the leather[30]. Different types of syntans which are used include Auxiliary syntans, Replacement syntans, Acrylic syntans, Whitening syntans, Bleaching syntans with each type of leather giving its own distinct characteristic. The amount of chemicals used is determined by the level of fullness required[11].

Fatliquoring

The leather is fatliquored to prevent fibre sticking when the leather is dried after completion of the wet processes. This is due to the reaction with the fibrous structure of the collagen with the fatty material. In the wet state the leather is fully lubricated by the water which is held in between the fibre bundles and between smaller fibrils. Now when the water is removed the fibre approach each other and can stick together thus the need of applying fatliquor[31]. Secondary effect is to control the degree of softness and suppleness. One of the results of lubrication is an effect on the strength of the leather. This also helps to confer to the leather with the physical characteristics, such as tensile strength, extensibility, wetting properties, waterproofness and permeability to water vapour and air. The extent of penetration of the oils to the leather determines its properties. It is important to ensure adequate lubrication of the fine fibrils as well as for the coarser fibril bundles. This can be achieved by use of fatliquor emulsions of small particle size capable of penetrating down the hierarchy of the leather structure. If the fatliquor deposits oil primarily in the outer layers, the non-lubricated central core gives springy characteristics to the leather[31].

Fat liquoring is usually conducted with self-emulsifying, partially sulfated or sulfonated (sulfited) oils, which might be animal, vegetable, mineral or synthetic. The sulfated oils are chemically treated with sulfuric acid, which increases the affinity for the tanned fibers. The fatliquor is added in form of an emulsion. The sulfited oils have smaller particles and higher capacity of bonding. Crude oils can also be added to the fatliquoring bath. They are water insoluble, but they are emulsified by the sulfated and sulfited parts. Fleshings from the animal has been used to produce natural fatliquor for the use in the fat liquoring process. This helps to turn the fleshing waste into valuable product for the process and reducing the environmental impact of the otherwise discarded fats[32].

Dyeing

This is the coloring step. Almost any color can be struck on any type of leather, despite the background color, although the final effect is influenced by the previous processes.

Dyes can be classified in different ways such as the method of application where we have Acid dyes, direct dyes, Basic dyes, Pre-metalized or Metal complex dyes, Reactive dyes, Sulfur Dyes. They can also be classified as either natural or synthetic dyes[11]. All the early dyes were natural ones from either vegetable or animal sources. Colored substances from fruits, flowers, leaves, roots, seeds, barks, wood and also galls of plants were extracted and used. Applying dye in solution or pigment, to confer dense, opaque colour, can be performed in the drum or colouring agents may be sprayed or spread by hand (padding) onto the surface of the leather. With the increase of environmental concerns researchers have found many natural dyes thus leading to reduction use of the azo dyes which contain potential colon carcinogens, which is a possible hazard to humans when chronically exposed. Natural dyes are nontoxic and non-allergic to human[33].

Drying and Finishing

After wet processing, hides are usually dried to remove excess water and prepare the skin for final finishing. Drying is considered one of the most important mechanical operation in the leather processing. Drying helps the leather to gain its final texture and flexibility. Tensile strength increases with apparent density and decreases with drying rate. There are different drying methods which are used in the leather processing. The leather can be free hanged in the air in overhead dryers, vacuum drying, and toggle drying. Toggle drying results in improved area yield and better mechanical properties due to the moderate drying temperature[28].

The finishing process includes mechanical treatment followed by application of surface finishes. This is aimed at enhancing the natural qualities of the skin and to cover defects which might have been on the surface of the leather. The finishing of leather can bring different colors and pattern appearances to the surface of the leather which makes it more attractive to the customer. Finishing is done by various materials such as casein, nitrocellulose, polyurethane, acrylic, other components of resin and polymer which are mixed with natural substances like oils, waxes albumins, cellulose esters. The desired color is regulated by use of different dyes and pigments. Different techniques used to apply the finishes includes curtain coating, roller coating, padding and spraying[34].

Leather sector

Leather is one of the most widely traded commodities in the world[35]. Leather industry plays a prominent role in the world's economy with an estimated global trade value of approximately US\$100 billion per year on average. The world trade in leather is currently growing the demand for leather and leather products is growing faster than supply.

According to World Bank report 2015, despite owning a fifth of the global livestock population, African countries account for 4% of world leather production and 3.3% of value addition in leather. In Kenya the leather sector contributes to estimated 4% to the agricultural gross domestic products. In 2013, leather

exports from Kenya amounted to only US\$140 million which accounts for 0.14 % of the world's export. Kenya is rich in leather raw material yet it cannot compete with globally. This can be attributed to inadequate leather processing capacity. Kenya tanning industry is developing and has been identified as one of the most important main earners compared to other east African countries. It is supported by infrastructural entities that ensures the delivery and processing of the raw materials[36]. The industry has a high potential to make high quality products that can address social economic problems and create employment and wealth. Estimated 80% of the raw skins and hides are processed up to the wet blue stage and a small percent up to the finished leather. About 10% exported as raw materials. Kenya manufactures an estimated 4 million units of leather products, which is a meagre amount compared to the deficit of about 28 million, considering Kenya's population alone. The optimal growth of the leather industry is dependent on the value addition[37]. High value added leather products can be used for industries like footwear, fashion, furniture, automotive. There has been an increase in the tanneries from eleven to fifteen from 2010 and that's gives a sign of growth in Kenya's leather industry. Most of these tanneries are processing 88% of raw hides and skins up to wet blue and 2% finished leather. The remaining materials are exported as law[38].

As Kenya strives to become an industrialized, middle-income country by 2030, developing the leather and leather industry offers an opportunity for industrialization and diversification of leather products[39]. This can be achieved by expansion of export market for semi-processed, finished leather, leather goods and footwear. The implementation of the government policy of imposing exportation tax of raw materials by 80 % from 2012 has encouraged the value addition. Since there is higher exportation of semi processed leather there is need to upscale to higher value chains to encompass footwear and Leather goods stages to achieve optimal returns enjoyed in global leather markets. Sustained value addition chains are important because they provide attention to customers' needs while reducing the costs[40].

Sources of raw materials

The leather industry supply chain constitutes three stages: production of hides and skins which is a waste from the meat industry, conversion of hides and skins into finished leather and manufacture of foot-wear and other leather products from the finished leather. The raw materials used in the leather industry are hides and skins. The skins are external covering or integument of small animals such as goat, sheep and pig while hides are external covering or integument of large animals such as cow, buffalo, and horse[11]. Bovine contributes the largest source of raw materials[41]. The skins and hides of cattle, sheep, pigs and goats are the main source for the leather production with percentages 65%, 15%, 11% and 9%, respectively[42]. The remaining percentage accounts for the exotic leather. Various sources of leather production in Kenya are cattle, camel, sheep and goat and exotic sources such as ostrich, crocodiles and fish[38]. With an increase in the fish processing factories in Kenya there has been an increase in the production of fish skins as wastes in the fish industries[43]. This fish skins can be converted to leather which can be used to make various leather goods. Having a strong base for raw materials is a key factor for the development of the leather

industry. Developing countries are the major producers of raw hides and skins due to climate and adequate husbandry for the livestock. This helps in producing raw materials of good grade which are free from surface defects and other structural deficiencies. This has resulted in the production of good quality leather and leather products. Livestock breeding, quality of flaying, transportation and preservation of the materials also affects the quality of the raw material with education on the flaying and preservation methods being a contributor to getting quality raw materials[40].

The raw materials can be supplied to the tanneries as either flesh raw materials, wet salted or sun dried. Flesh raw materials are preferred since they do not require a lot of time to rehydrate as compared to the sun dried materials. Sorting of the raw materials before processing them is important since only quality raw materials are selected for processing thus producing high quality leather[11].

Fish skin

Fish leather are exotic leather types which are yet to gain general acceptance due to the limited literature available. Exploitation and application of fish leather is limited to lack of understanding of the properties of fish leather. The leather has an outstanding natural grain pattern formed by the pockets of the scales which makes it attractive and this has led to the increasing demand of the leather products made from fish leather. The uniqueness of the fish leather gives it a high market value[44]. There are many fish species which are available such as sturgeon, Nile perch, tilapia, salmon, carp, and stingray. Each species have a unique characteristic appearance. Some of these fish skins such as stingray has been used to produce soft leather[45]. In Kenya Nile perch fish is dominant thus it is the most traded and popular with the customers. It is abundant in Lake Victoria. Nile perch expansion has led to increased fishing activities along Lake Victoria. There is increase in the fish processing industries along the shores of Lake Victoria which leads to increased fish processing thus generating a lot of wastes[46]. Production of fish products leads to production of high volumes of byproducts. Disposing and managing wastes is a challenge facing the fishing sector in Kenya[46]. The solid fish wastes make up 30 - 40% of the total production, depending on the species processed. The solid waste is composed mostly of fish head and viscera, skin, scales, dorsal and ventral offcuts[3]. Reportedly, about 150,000 tonnes of fish waste is produced every year and 80% of it is dumped. These by-products are sources of pollution when disposed to the environment especially because they act as breeding grounds for mosquitos and other microorganisms, in addition they are sources of bad odour especially to people living in the surrounding places and also pollutes the environment due to decomposition. The waste generated can be processed into by products and sold to earn the industry money and reduce environmental pollution through dumping of wastes into the environment[47]. The fish skins can be used as raw materials for the leather industry to supplement the available bovine, goat and sheep skins as a new emerging source of raw material. To succeed as a new product fish skin leather must be presented in such a way that it provides a unique appeal to the customers as compared to the other materials. Reports of converting the Nile perch fish skins to leather has been reported in Kisumu but no scientific data has

been reported on the characterization of the structural, physical and chemical properties of the fish leather.

Chemical composition of fish skin

Nile perch (*Lates niloticus*) is a warm water fish species. The length of the Nile perch increases with age with young (less than 80 days old) fish measuring as little as 6.4cm and the largest adult (13+ years old) measuring up to 160 cm long for males and 190 cm female[48]. As the fish grows, the skin proportionally thickens due to the increasing amount of collagen fibers, which will react with the tanning agents and give the characteristic resistance to the leather. The fish skin is composed of collagen fibers that forms alternating layers of right and left helices wrapped about the long axis of the animal. Collagen is a general extracellular structure protein involved in the formation of connection tissue. The fish skin has type I collagen. Collagen constitutes 25% of the total proteins[49]. The collagen differs with the amino acid sequence of the glycine, proline and hydroxyproline. The variation of the amino acids affects the stability of the collagen. Composition of the skin in relation to amino acids has a great influence during the processing of the fish skin and this gives the ability to change the properties of the collagen. Warm water fish species has high amount of amino acids and low content of hydroxyproline[48]. The crosslinking of the collagen is different in various ages since as the animal ages the crosslinking of their collagen increases and the type of cross link changes[48].

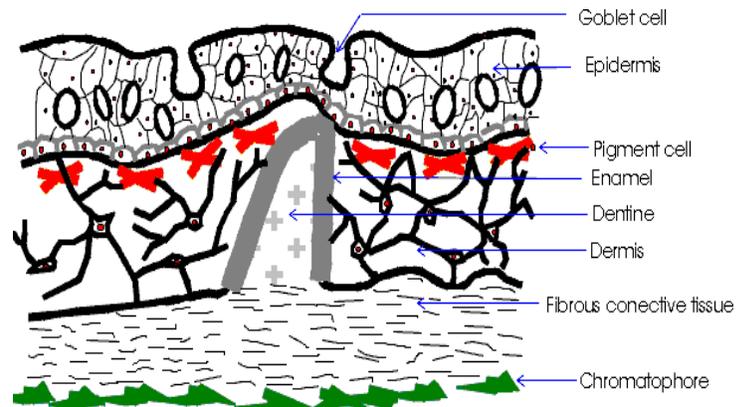


Figure 1. The structure of the fish skin

The Nile perch skin has scales in which the pockets of the scales gives an attractive appearance to the finished leather unlike Stingray which has denticles[45].

II. TYPES OF TANNAGES

Chrome tanning

Chrome tanning is the most widely used tannage in leather industry and it accounts for 85% of the world's leather production. It gives the leather comfortable feel, it's lighter, soft, and brighter and have high hydrothermal stability. Besides, chrome tanning is still the most important and most widely used tanning method in the leather industry due to its outstanding leather quality, good strength and competitive price[50]. But it's a controversial method from the view point of environmental protection due to the

presence of the chromium and chloride content in wastewater as well as abundant waste chrome shavings. About 70 % of chromium salt penetrates and the rest remains in the liquor which is discharged for treatment. High chrome exhaustion or recycling of the chrome liquor is recommended to decrease chrome present in the liquor[23]. There are a range of factors which influences the chrome absorptivity. The process parameters largely affect the chrome absorptivity to the collagen. There are two main features of chromium salt which enable it to act as a tanning agent. Firstly, the complexes formed are of intermediate stability, and thus exchange of coordinating ligands can take place comparatively easily. Secondly, chromium has the ability to form polynuclear complexes in which Cr-O-Cr bridges are involved[1].

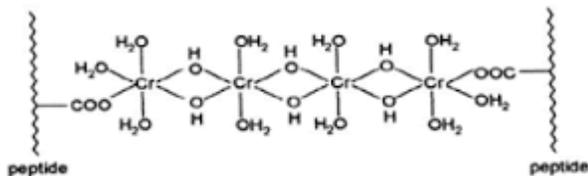


Fig 2. Chrome tanned cross linkages with collagen (protein) of the skin.

The mechanism involved is initial penetration of chromium (III) salt in solution into the pelt and down the hierarchy of the structure. Increasing the reactivity of the basic chromium (III) salt and carboxyl groups of the collagen by gradually increasing the pH of the solution. Creation of unipoint and finally multi point cross linkages, conferring a stable matrix collagen structure[11]. Tanning action increases as pH increases, and no tanning occurs at all when all carboxyl groups of the collagen molecules are protonated[11]. The practical measure of degree of chrome tannage is that of thermal stability (Covington, 1997). At the completion of any tannage the leather is tested to see what temperature, under wet conditions, it will stand. If it will resist 100°C (boiling water) it is considered to be satisfactorily tanned.

Vegetable tanning

In 18th century before the introduction of chrome tanning method, the options available to the tanners were limited to vegetable tanning. Vegetable tannins are considered less polluting compared to chromium and the oldest known leather tanning agent. Vegetable tanning involve treating the hides and skins with leaves and barks containing tannins. Tannins are water soluble polyphenolic compounds having a molecular weight of 500-20,000 and ability to precipitate proteins and alkaloids[51]. There are two types of tannins based on their structure and properties. Pyrogallol tanning materials or hydrolyzable tanning materials, include the tanning materials made from oak wood, chestnut, myrobalan, algarobilla, vallonina, divi divi, nut gall and sumac[52].

The hydrolyzable tannins are subdivided on the basis of polyphenolic acid, or acid liberated or hydrolysis, those yielding gallic acid are referred to as gallo- tannins while those yielding ellagic acid are referred to as ellagitannins[1]. Pyrocatechol tanning materials or condensed tanning materials are the tanning materials made from quebracho wood, mimosa bark, pine bark and mangrove bark as well as gambier extract[52]. Their solutions having a pH of between 4.5 to 5. Condensed tannins on the other

hand do not breakdown with acids, instead they give more complex compounds under the action of acids to yield tannin reds[53]. Both condensed and hydrolysable tannins have ability to crosslink with collagen to form a non-putrescible and hydrothermal stable leather. The interaction of the vegetable tanning material with the protein collagen can either be Hydrogen bonding of tannin to protein through the phenolic hydroxyl group of the tanning material or binding of tanning material to the protein through the more diffuse electrostatic bonds due to forces known as Vander Waals forces. Different sources of vegetable tanning materials gives leathers different physical properties. Vegetable tanned leathers offers benefits of high tensile and tearing strength , elongation, breathability and insulating properties, capacity to absorb and transmit moisture, lasting molding ability and flexing endurance[54]. Vegetable tanned leather is used in making heavy leather such as furniture leather, garment leather and shoe upper leather[53].

Oil tannage

Oil has potential as a leather tanning agent for chamois leather. Chamois leather is a well-known product. It has specific uses, such as in high quality gasoline filtration, cleaning and drying optical equipment, spectacles, mirror, and vehicles. This is because of its softness and high water absorbance. The material has to be soft so that it does not scratch the surface to be cleaned[55]. Oil can be from different sources such as fish oil, rubber seed oil, cod liver oil among others. The traditional method of making chamois leather was to impregnate the skins with oil and then hung them in warm stoves to allow oxidation to occur. The excess oil was removed by hydraulic press then washed in warm alkaline water. The principle of modern oil tannage is to oxidize the oil already introduced into the pelt, with the help of atmospheric oxygen under controlled conditions[56]. Long oxidation periods required for making chamois leather places limits on large scale manufacture. Research is being carried out on use catalysts to reduce the oxidation time. The process using ozone to accelerate oxidation of the oil tannage, produced leathers with organoleptic properties comparable to those of conventional chamois leathers. In this approach it has been found that the use of ozone can reduce the oxidation time to 60 min from 10 – 12 days without any impairment in quality [56]. Tanning using fish oil faces an odour problem, caused by oxidized fish oil residues attached to the chamois leather. The odour cannot be removed completely from the leather. Reducing the use of fish oil in the chamois tanning would help to reduce the odour. Rubber seed oil is a vegetable oil which is expected to substitute for fish oil in tanning. The oil will not produce odour and might be able to cross-link with protein in the skin or hide to produce leather[6]. The formaldehyde pretannage helps to increase the penetration of fish oil and protects the pelt from putrefying during oxidation periods[57]. Oil tanning process takes about 12 days compared to chrome tanning which takes approximately 6 hours, and this explains why the technology is not commonly used. The shrinkage temperature which is a measure of degree of tannage, oil tanned leather has been reported to shrink as follows, for the rubber seed oil tanned leather 73 +/- 2°C and 71 +/- 2°C for the fish oil tanned leather[6].

III. ALDEHYDE TANNING

Aldehyde tanning system is used to produce chrome free leather by cross linking the amino groups of collagen with glutaraldehyde or formaldehyde to prevent purification. The crosslinks formed in collagen fiber through the reactions of glutaraldehyde are irreversible. Although it is a tanning method which produces chrome free leather the crosslink between aldehyde and collagen is weaker than the crosslink between collagen and chrome salt[58]. Natural polymers containing an aldehyde or a masked aldehyde group have also been employed for tanning[59]. Pretanning with aldehyde produces leather with a shrinkage temperature range of 70-80 °C. Aldehyde tanning is often referred to as “wet white” due to the pale cream color it imparts to the skins. Formaldehyde is highly toxic to all animals and human’s ingestion of little solution containing 37% formaldehyde has been reported to cause death in an adult human and also carcinogen[60]. At concentrations below 2ppm it is an irritant to the eyes and has respiratory effects, repeated contact with solutions may cause eczematoid dermatitis. Maximum tolerance limit for formaldehyde in finished leather articles for adults is 150ppm and for children is 75 ppm Glutaraldehyde also has toxicity problems and may cause similar problems[61]. This this method is not normally often used but it can be used with other materials in the process of tanning[58].

IV. COMBINATION TANNAGE

This type of tanning is mainly done to reduce the environmental constrains caused by chromium salts. In this process there is use of less chromium combined with other tanning agent or other tanning materials can be combined to give leather with better properties. The alternative tanning system should not only match the properties of chrome but should also add more value to the leather in terms of special properties imparted by the chosen metal ions. A research conducted by Fathima, Kumar [62] about new system of combination tannage where they explored silica-aluminium-tetrakisphosphonium sulphate showed a significant reduction of emission loads in COD and TS by 41 and 67%, respectively. The shrinkage temperature was recorded to be 86°C which is higher than that of silica alone[62]. Some of the vegetable combination systems studies include vegetable-oxazolidine[63], vegetable-aluminium[64], vegetable-zinc[65], vegetable-acrylic[66], vegetable-glutaraldehyde[67]. Leathers tanned with these combinations resulted to shrinkage temperature values of near 100°C and they had good physical-mechanical properties adequate for variety of applications.

V. CLEANER LEATHER TECHNOLOGY

With the increasing push by the international consumers and national governments to reduce the toxicity to the environment and limit harmful chemicals in the products lot of research is being done to find alternative processing methods. Cleaner technologies have been adopted in the recent past which have the benefit of saving chemicals, reduction of TDS, BOD, and COD to the effluent, low level of chromium in effluent and lower hazardous air emissions.

Leather processing is divided into three stages (i) pre-tanning or which clean the hides or skins; (ii) tanning, which permanently stabilizes the skin or hide matrix; and (iii) post-tanning and finishing operations, where aesthetic value is added[11].

Raw hides and skin are preserved before processed into leather. Salt preservation is the most used practice globally. This results in the generation of quantities of total dissolved solids (TDS) one of the pollutants that are very difficult to treat consequently. Possibilities of using other methods of preservations have been analyzed in order to reduce the pollution load in the soaking process of leather. Sivabalan and Jayanthi [68] studied the use of plant extracts as an alternative preservation method and concluded that it has the capacity to preserve skin by antimicrobial activity present in the plant extracts[68]. Use of less sodium chloride combined with either silica gel, boric acid, sodium meta-bisulphite showed a great potential as an alternative for sodium chloride preservation. Potassium chloride is a good substitute of sodium chloride without the environmental consequences associated with sodium chloride although it is expensive. Chilling, vacuum electric current and irradiation are some of the physical techniques which can be adopted to replace sodium chloride although they are limited to short term preservation[69].

Soaking is the first step in leather processing and use of enzymes is recommended since it has the advantages of reducing the soaking time, initiating the opening of the fibres. The enzymes used in soaking target broad-spectrum of reactions not specific reaction thus obtaining solubilization[15]. Soaking process alternatives based on counter-current method have been suggested. Use of flesh hides and skins also helps in reducing the total dissolved solids and also reduces the time needed for soaking. The conventional liming and un-hairing process uses calcium hydroxide and sodium sulphide. Due to high amounts of BOD, COD and TS caused by use of lime and sodium sulphide several process alternatives to lime and sulphide mixture have been considered and explored. Enzymatic treatment of leather using proteolytic enzymes which catalysis the breakdown of protein is an alternative method which aids in the reduction of the amount of lime and sulphide. The origin of the enzymes can be bacterial, animal, plant or fungi. The enzymes can be used in hair saving unhairing where enzymes attack the bond between the hair and derma thus lead to loose the hair. Recovering the hair eliminates the discharge load of COD and nitrogen. Immunization of the hair has also been proposed where sodium silicate was used to substitute lime and significant reduction in chemical oxygen demand (COD), biochemical oxygen demand and total Kjeldahl nitrogen were obtained in comparison with the comparative data for the conventional unhairing with hair burning[70]. Re use of the unhairing–liming liquids before discharging them to reduce the concentration of the chemicals was reported and the modified method reduced the environmental impact of the process by 24%, COD was reduced by 50% as well as sulfide which was reduced by 73% when the process water was recycled four times. The use of sodium aluminate as an alternative to calcium hydroxide was tested in the liming process and resulted to good opening up of the fibres and reduce pollution[71].

Conventional deliming agents are ammonium salts (ammonium sulphate and ammonium chloride). These chemicals

release nitrogenous pollution to the environment and also release ammonia gas to the air. To reduce these emissions alternatives ways of deliming have been studied. Carbon dioxide deliming can be used as an alternative for the ammonium salts although it has low penetration rate and it is expensive since gas feeding systems have to be designed in the conventional drums[16]. Another alternative for non-ammonia deliming was suggested by Zeng, Lu [72] where they used sodium hexametaphosphate and boric acid to replace ammonium salts. The research concluded that boric acid and sodium hexametaphosphate gave the deliming liquor a pH range of 8-8.5 and thus prevent the risk of acid shock[72].

Conventional pickling process which is done to aid in the penetration of tanning agents uses salts such as sodium chloride[11]. The release of these salts results to environmental pollution thus alternative ways have been studied to prevent this. Salt-free and low-salt pickling as well as no-pickle tanning techniques have been developed to minimize chloride impact in the environment[73]. Application of non-swelling chemicals such as auxiliaries have been studied and treatment with 2% p-hydroxydiphenyl sulphonic acid is a valid alternative to reduce salinity. This auxiliary agent showed non swelling capacity. The residual bath of the pickling process with this chemical had the lowest conductivity and COD values. Also Naphthol 3-6-disulphonic acid reduced the conductivity and COD values of the pickling residual bath when compared with those of the conventional pickling process[18]. Leather tanning is dominated by chromium salts due to the unmatched properties that chromium gives to the leather. Chrome tanned leather has high thermal stability, physical-mechanical property, excellent soft touch and good anticorrosive property[74]. Discharge of chrome can lead to accumulation of heavy metals and this can be toxic to plants, fish and human beings. If chrome (iii) is oxidation to chrome (vi) it causes cancer if human beings are exposed to it. A lot of research has been done either to totally eliminate chrome in the tanning process or reduce the chrome that is drained to the effluent[75]. Vegetable tanning is one of the alternative to eliminating the chrome salts in the tanning process. Many researchers have identified various plants extracts which can be used as tanning extracts[1, 5, 51, 53]. High chrome exhaustion is another alternative which increases the absorption of the chrome into the leather and thus reducing the content of chrome in the effluent. Some of the high chrome exhaustion methods which have been studied include tanning without the addition of float to the leathers, diminishing the amount of added salt and obtaining greater amounts of chrome fixed to the hide. There various aids which helps in chrome exhaustion such as Long chain carboxylic acids, Aromatic polycarboxylates, Silicates of Mg or Al, Polyacrylic acids, Polyamides, Mannich bases, Protein hydrolysates[76]. The recovery of chromium from spent tanning and re-tanning baths provides a significant economic advantage in terms of both its reuse and the simplification of the processing of global wastewaters[77]. Combination tannage where there is use of small amount of chrome salt and other tanning agent can also be used to reduce the amounts of chrome salts in the waste[78].

VI. PHYSICAL CHARACTERIZATION OF FISH LEATHER

Among other things that are used to assess the quality of the leather, physical properties are the most important. The

properties are affected by factors such as species, age, weight, sex, skin orientation, source of the material and mainly tanning process[3]. The range of physical properties determines the quality of product. Various physical, chemical and fastness properties are required from leather products depending on their field of use. Some of the parameters used to test the physical properties of leather includes the tensile strength, tear strength, elongation, flex resistance and burst strength. Tensile strength helps to calculate the elongation and percentage elongation which indicates how long the material is stretched before break. The samples for tensile strength are sampled parallel and perpendicular to the back bone. This is because of how the fibers of the leather are aligned, the tensile strength is dependent on the fibre direction. From literature the different fish species have different tensile strengths. Focking, Simoes [3] who processed Nile Tilapia (scale fish) skins with chromium salts obtaining 13.06 N/mm², Karthikeyan, Babu [45] also processed stingray fish skin and obtained a tensile strength of 28.05 N/MM². Taotao, Qiaoqiao [27] who processed sturgeon fish skin and obtained a tensile strength of 19.60 N/mm² and according to Pessoa da Silva, Bertoldi [44] who processed cat fish skin and obtained 23.40 N/mm². The variation of the tensile strength is due to the composition of the collagen and also the different species of skins have different skin structure. The variation can also be affected by the tanning agent used in the stabilization of the material with chromium tanned materials having a higher strength than the vegetable tanned leather. The Nile perch fish leather tensile strength has not yet been reported and that's got to the attention to investigate its strength. Tear strength is a physical property where the leather is exposed to highly concentrated stresses under a specified load. The main aim is to find the amount of force used to break the test piece material. This property is important as it is associated with softness, tensile strength and dome plasticity and helps to evaluate these materials more comprehensively[50]. It is also dependent on the species since from the literature it has been reported that the different species of fish skins have different tearing strengths. Burst strength is also a result of leather deformation under the impact of force. It is usually concerned with the behavior of shoe upper on the durability and lasting of shoe making. Four parameters are measured distention at grain crack, load at grain crack, distension at burst and load at burst. Flex resistance is used to asses durability of the leather used for shoe upper. The material is subjected to a specified amount of flexes and observed for any change. Good flexibility of leather prevents emergence of cracks and deterioration of surface finish after repetitive flexing during a leather items life cycle (IULTC/IUP 20, 2001). Shrinkage temperature determines the thermal stability of leather which can be determined by using shrinkage temperature apparatus or by use of differential scanning calorimetry. Shrinkage temperature varies with different tanning agents. A good leather should have a minimum shrinkage temperature of 75 °C[11].

VII. CONCLUSION

With the largest source of raw materials for leather industry in Kenya being from hides and skins of cattle, goats and sheep there is need for diversification. Exotic leather supplements the raw materials although there has not been any commercialization of production of the exotic leather in Kenya. Due to the increased

consumption of fish in Kenya there is increased production of fish skins which are normally discarded as wastes. The Nile perch is the most commonly consumed fish species therefore its skin is available. The raw material should be explored to produce fish leather and determine the physical properties which can help predict the final use of the leather

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Importance of Antenatal Care, Factors Affecting Utilization of ANC in Bombali District- Northern Sierra Leone

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Abstract- Maternal mortality continues to pose challenges as Sierra Leone record the highest maternal mortality rates in the world (857 per 100 000 live birth). This study sought to determine the importance of antenatal care and factors affecting utilization of antenatal care service in Bombali district Northern Sierra Leone. A cross-sectional study that combines both qualitative and quantitative data collection methods were conducted for 174 Antenatal Care attendees and 26 health care providers. The collected data is analyzed using a simple descriptive statistics with the help Excel Microsoft ware. The findings observe that; women were not satisfied with the care, although they are still engulfed in the traditional myths and misconceptions. A statistical significance was found in relation to knowledge, ignorance, low income, age and distance to the health facilities. The study recommend to improve women access and utilization of Antenatal Care services by continuous community based health education and facility-based education.

Index Terms- Antenatal care, free health care initiative, maternal mortality rates, focussed antenatal care

I. INTRODUCTION

A 1.1 Background of the study

Antenatal care (ANC) in Sierra Leone is regarded as an important health care and health promotion activity that aims at enhancing maternal and foetal well-being during pregnancy as well as favourable pregnancy outcomes. Reduction of maternal and neonatal mortality remains a major challenge to attaining global social and economic development. Worldwide, more than 515,000 women die each year from pregnancy and childbirth complications while four million babies die within the first week (neonatal period) of life. (ROK, 2006; WHO, 2007).

Maternal morbidity and mortality in developing countries, like Sierra Leone, continue to pose challenges to the health care delivery system. The Sierra Leone Health and Demographic Survey 2008 reported that 87% of pregnant women had attended antenatal care at least once, only 25% of births were institutional deliveries and 43% were supervised by skilled attendants. In addition to its high child mortality rate, Sierra Leone has one of the highest maternal mortality rates in the world, with a maternal mortality ratio of 857 per 100 000 live birth. The proportion of babies born in a health facility was generally low in most regions

but was lowest (15.5%) in the Northern Region. The MDG report postulates that maternal deaths can be reduced if women have access to ANC and other maternal services and that maternal services should aim at empowering Sierra Leonean women.

Globally, Sierra Leone is ranked among the countries with the worst maternal and child health indicators. The death of women and children can be prevented by simple cost-effective community-based interventions. However, there has been a tremendous decline in maternal mortality ratio (MMR) worldwide. Despite this recent decline, Sub-Saharan Africa has the highest MMR in the world albeit strategies and interventions that prioritize maternal health (Hogan et al. 2010; WHO 2012).

Globally scientific evidence has shown that low utilisation of Focus Antenatal Care services is influenced by some factors such as low maternal education, teenage pregnancies, multiparity, unplanned pregnancies and cultural factors (Simkhada et al. 2008). The maternal mortality ratio (MMR) and proportion of births attended by skilled personnel are important indicators of quality maternal health (APHRC, 2002). The MMR is unacceptably high at 414 per 100,000 live births with 30 women suffering long-lasting injuries and illnesses per every woman who dies. Only 42% of women deliver with a skilled provider (CBS, 2004; ROK, 2006). Studies clearly indicate that countries with high maternal, perinatal and neonatal mortality have inadequate and poor quality of health services. Studies have linked low utilization to poor pregnancy outcomes, which ultimately lead to higher maternal and neonatal morbidity and mortality (Raatikainen et al. 2007).

One of the strategies aimed at addressing maternal mortality in developing countries is the implementation of focussed antenatal care (FANC), which is the care a woman receives throughout her pregnancy (WHO 2002). Trials conducted in Argentina, Cuba, Saudi Arabia, and Thailand proved that FANC was safe and was a more sustainable, comprehensive, and effective antenatal care (ANC) model (WHO 2002). Based on results from trials on FANC, the World Health Organization (WHO) in 2001 issued guidance on this new model of ANC for implementation in developing countries. The new FANC model reduces the number of required antenatal visits to four, and provides focused services shown to improve both maternal and neonatal outcomes.

1.2 Geography and administrative system of Bombali district

d. What barriers might impact negatively on the utilisation of ANC services?

e. What can be done to enhance the current practices and perceptions of health care providers towards the utilisation of ANC services in Bombali?

1.5 Null hypotheses

There are no important factors affecting utilization of antenatal care services in Bombali district of Sierra Leone

1.6 Objectives of the study

1.6.1 General objective

The general objective of the study was to examine the importance of antenatal care, factors affecting utilization of antenatal care service in Bombali district of Sierra Leone.

1.6.2 Specific objectives

The study's objectives sought to:

- 1) To determine factors influencing late attendance for antenatal care services in Bombali district
- 2) To establish the challenges faced by care providers in the provision of quality antenatal care.
- 3) To establish the knowledge of mothers about the benefits of seeking ANC early.
- 4) To establish the current practices and perceptions of health care providers towards antenatal care services.

1.7 Significance and anticipated output

Improvement of quality of ANC is a major strategy used by hospitals and health care facilities to reduce maternal death and morbidity. The study was aimed at identifying gaps and barriers in the provision of quality ANC facilities, which when addressed will go a long way in strengthening the capacity and credibility of public ANC. This will result in improved client satisfaction, sustained use of services and improved outcomes of care. Women presenting themselves for ANC services will be empowered to make informed decision on their health and that of their infants, and reap maximum benefits from care. Effective utilisation of ANC services, through early booking for ANC, receiving health promotion information and health care, is crucial to enhancing maternal and foetal health during pregnancy and reducing mortality and morbidity statistics.

II. LITERATURE REVIEW

2.0 Antenatal care

Antenatal care is a necessary health sector for every pregnant woman and the newborn baby. Pregnancy is a crucial time to promote health behaviors, prevent complications and avoid new born-illness. Essential interventions including, TT immunization, identification and management of STIs, malaria prevention and treatment, identification and management of pregnancy complications such as anemia, nutrition, counseling, preparedness and counseling on maternal and new born danger signs.

The usual recommendation nowadays is for booking (first antenatal visit) to take place in early pregnancy, prior to 14 weeks. The World Health Organization (WHO) recommends that pregnant women in developing countries should seek ANC

within the first 4 months of pregnancy. A WHO Technical working Group recommended a minimum of four antenatal visits for a woman with a normal pregnancy (lancet, 2001). However, some women require more than four visits especially those who develop complications (lancet, 2001). Although progress has been made globally in terms of increasing access and use of one antenatal visit, the proportion of women who are obtaining the recommended minimum of four visits is too low.

The coverage, affordability, and sustainability of ANC services package need to be assess over time. This requires countries to respond to certain key questions: How to re-organize services to ensure delivery of a comprehensive, integrated package and assessing the contribution of the package to improve quality of care and components required in strengthening over time.

The person with midwifery skills who is part of and lives in the community can offer ANC services. However, in developing countries like Sierra Leone which have a shortage of well-trained health care personnel, ANC care is often provided by less qualified staff such as auxiliary nurse/midwives, maternal and child health aid, and Traditional birth attendants (TBAs) whose background may be conditioned by strong cultural and traditional norms which may hamper the effectiveness of their services. For the fulfillment of complete set of tasks required to manage normal pregnancies and births, their skills need to be improved through education, training and supervision by well-trained midwives.

The world health organization estimates that there are 5.1 million deaths in the new born period; that is before the baby is one month old. Almost 3.4 million of these occur during the first week of life, while 4.3 million fetal deaths are estimated to take place before or during delivery. These prenatal deaths are largely consequences of poorly managed pregnancies and deliveries or the result of inadequate care of neonate during the first critical hours of life.

Every year some 200 million women become pregnant. It is estimated that more than 50 million women each year develop pregnancy-related complications, which require medical attention (Murray C.J.L, 1997). For close to 600,000 women pregnancy-related complications are fatal (WHO, 1996). Nearly all maternal deaths occur in developing countries and among the most vulnerable and disadvantaged population groups. The current global estimates show that in the developing world approximately 65% of pregnant women receive at least one antenatal care visit. 40% of deliveries take place in health facilities and slightly more than half of all deliveries are assisted by skilled personnel. This contrasts sharply with developed countries where practically every woman receives regular care during pregnancy, delivery and postpartum period. By the end of 20th century, it was estimated that every year an estimated 45 million pregnant women were still receiving no antenatal care, more than 75 million births take place at home and 60 million women giving birth with only a traditional birth attendant or a family member present; in many cases the mother is alone.

In less developed countries 35% of pregnant women receive no antenatal care at all during pregnancy, 70% and 90% of women receiving antenatal care return for a second visit. The proportion of women continuing care for 4 visits or more is, however, markedly lowers. Data on the timing of the first

antenatal visit reveal care usually starts sometime in the first 5 or 6 months.

Generally, many factors contribute to less utilization and access to antenatal care services: high rates of teenage pregnancy, low perception of pregnancy related risks, low level of female involvement in reproductive health and rights, harmful and negative culture on reproduction, gender relations, and health seeking behavior as well as poor infrastructure.

2.1 Barriers to utilization of Antenatal care services

A good deal of literature has identified a number of barriers faced by women in seeking professional health care, particularly for maternal services (Park Hurst J, country report, 2005). The perception of a normal versus a complicated delivery, for instance, appears to influence where women will look to deliver, regardless of other barriers at times. In Sierra Leone lack of resources and skilled staff to improve quality and delivery of maternity services, despite good policies and concerted efforts, have hindered the increase in the utilization of those services by women or a reduction in the high ratio of maternal deaths (Kanu JS, Tang Y, Liu Y 2014). Yet there has not been an increase in the utilization by women of emergency obstetric services at health facilities nor a corresponding significant reduction in maternal deaths. The proportion of women delivering in health units remains low and there is a gap between the numbers attending antenatal services and those delivering in health services (Statistics Sierra Leone (SSL) and ICF Macro 2008).

ANC is an opportunity to promote the use of skilled attendance at delivery and healthy behaviors such as breastfeeding, early postnatal care, and postpartum family planning for limiting or spacing births. However, studies have shown that there are many missed opportunities for care, both because of client- and health system-related factors. Mothers and children may face risks because of limited or late-term ANC visits, low-quality care during visits due to poor provider training, infrastructure and administrative weakness at facilities (Armar-K, 2006).

The individual's use of the health facility is also influenced by the characteristics of the community in which the person lives, indicating a need to look beyond the individual factors when examining health seeking behaviors (Stephenson R, 2002). First, consumers lack of the human capital-education to promote their own and their families' health (Tim Ensor, 2004). Education may provide consumers with a basis for evaluating whether they or a dependent require treatment inside or outside the home. Education provides the consumer with the basis for evaluating whether they require treatment. While it is sometimes suggested that individuals are unable to assimilate information on treatment options, this assumption is challenged by Leonard's recent work in Tanzania (Leonard K.L, 2002).

Studies in many countries have also shown that barriers such as distance may be surmountable, as evidenced in cases where individuals bypass local services to reach ones of higher quality or when Distance is given as a reason for non-use, despite health facilities being available. There is much evidence to suggest that distance to facilities imposes a considerable cost on individuals and that this may reduce demand. In studies reviewed for this study, transport as a proportion of total patient costs, a study carried out in Bangladesh suggested that, transport to

health facilities was the second most expensive item for patients after medicines (CIET Canada, 2000).

Location and distance costs are often seen to negatively impact ANC service utilization. A study in Vietnam found that distance is a principle determinant of how long patients delay before seeking care (Ensor T, 1996) Another, in Zimbabwe, suggested that up to 50% of maternal deaths from hemorrhage could be attributed to the absence of emergency transport.

A study in Australia found that the impact of costs fell most heavily on the poor. Two types of barrier are critical: physical and financial. In poor countries, the density of health infrastructures equipped and staffed with competent, available and committed personnel is low (Koblinsky M, et al, 2006). For women this often means they are too far to walk' and they prefer to deliver at home rather than embarking on a long and difficult journey to under-equipped health centres or poorly staffed district hospitals. When women or the family decision-makers decide to attend an appropriate health service, the next obstacle is money.

Cultural and socio-economic factors such as the low status of the female in society, limited decision making powers, social immaturity and financial limitations might contribute to poor utilization of ANC services, resulting in an increased incidence of pregnancy and obstetric complications. Bouwer et al added that religious beliefs in certain societies may pose barriers to the utilization of ANC services. Bouwer et al recommended that health workers should understand variations in family composition, social class, health beliefs and behaviors and be able to bridge the gaps between the beliefs and behaviors. At the community level the TBA is also vital in influencing demand. One study in Rajasthan found that more than 90 percent of women that did not obtain referral care were advised against it by the TBAs (Hitesh J, 1996).

Cultural norms, restrictions, can prevent women from seeking health care outside the home for themselves and their children. This barrier is often raised still further when men provide services, and has been offered as one reason why Asian women living in Western countries often make little use of health services. Another example of culture as a barrier to using health services is the perception and unacceptability of modern contraception among men in parts of many rural areas.

In general most specifications do not include interaction variables between demand-side barriers and income. As a consequence, most literature indicates the specific contribution of economic status on demand for services rather than indicating whether barrier-elasticity differ by economic status. The evidence certainly provides some support for the intuitive hypothesis that barriers are more important for the poor. There is, however, a dearth of evidence that quantifies these barriers. In addition, in some cases lower opportunity costs among low-income groups may sometimes mean that barriers are greater for the non poor.

A review by WHO found that the direct costs of maternal health care range between one and five percent of total annual household expenditures, rising to between five and 34% if the woman suffers a maternal complication (WHO, 2006). Globally, \$15 billion is estimated to be lost every year due to reduced productivity related to the death of mothers and neonates.

Policy interventions on the demand and supply sides must progress in cycle.

Poor quality of health services is a major problem in many, but not all, developing countries (World Bank Report, 2004). However, facilities open and close irregularly; absenteeism rates of doctors and nurses can be very high; staff can be hostile, even violent to patients; misdiagnosis is not uncommon, medicines are all too often unavailable, sometimes due to staff pilfering for use in private practice; and there is inappropriate prescribing and treatment. Deficiencies in quality have direct implications for access to effective health care. Further, one expects that demand will diminish in response to the poor quality of the care offered. This confirmed by the example of Ghana where a decline in quality of public health care was associated with 40% fall in utilization within only five years (1979-1983).

A second problem is that the available resources are not allocated to the most effective interventions, are geographically concentrated in large cities, and do not reach the poor. Despite the WHO *Alma Ata Declaration*, the bulk of public health expenditure continues to be absorbed by hospital based care delivered at some distance from poor rural populations. Shifting the balance of resources further toward primary care would not necessarily have the desired impact on the level and distribution of population health. However, there are major deficiencies in the quality of primary care delivered in many developing countries.

2.2 Intervention measures to the barriers affecting the utilization of Antenatal care services

In the health sector, there are a number of policies with implications for maternal service provision. To expand the platform for health care services, the private sector is foreseen to play an important role in the implementation of the national health policy and a public-private partnership policy has been drafted to set the modalities of the collaboration (Freddie S Sengoba, 2004).

Women's disproportionate poverty, low social status, and reproductive role expose them to high health risks and preventable death. Yet cost-effective interventions like the free health care initiative (FHCI) in Sierra Leone makes it possible for more women and children have easier access to health care and stop these unnecessary inequalities. To achieve the greatest health gains at the least cost, national and donor investment strategies have given considerable emphasis to health interventions for women, particularly during their reproductive years. There has been much progress in improving women's health; however, some challenges remain and new ones keep emerging.

Prevention of unwanted or ill-timed pregnancies is also essential to improving women's health and giving them more control over their lives. Safe motherhood interventions can strengthen the performance of the overall health system. The effectiveness of maternal health services is often hampered by organizational and institutional constraints. Improving access to good-quality maternal health care remains a challenge in many countries because it requires a functioning primary health care system in the community and a referral system to a health facility capable of providing emergency obstetric care. Safe motherhood

interventions designed to integrate various levels of the health sector can thus bring about improvements that more broadly affect the health system.

Interventions to improve women's educational attainments are potentially wide reaching and mostly outside the traditional scope of the health sector. Apart from improving the general standard of, and access to, education, targeting schemes for raising female enrolments have been developed to include financial and non-financial. Schemes to empower women may be helpful in breaking down historical barriers to seeking care. Services that are sensitive to prevailing cultural conventions, without compromising medical standards, may also have an impact on the demand for services.

Promoting health and confronting disease challenges requires action across a range of activities in the health system. This includes improvements in the policymaking and stewardship role of governments, better access to human resources, drugs, medical equipment, and consumables, and a greater engagement of both public and private providers of services. Experience has shown that, without strategic policies and focused spending mechanisms, the poor and other ordinary people are likely to get left out.

If health services are not of adequate quality, no amount of demand stimulation will induce people to access them. It is also important to realize that many potential interventions on the demand side are extremely wide ranging and often stray a long way outside what is traditionally seen as the health sector. In practice many of the interventions may have to be conducted through ministries other than health a challenge for cross-government collaboration. The development of poverty strategies provide one forum for such joined up policymaking and suggest a real opportunity for grounding many of the interventions in genuine collaboration.

Delivery of essential services concentrates on improving the quality of staff skills, protocols of treatment, availability of supplies and environment of health facilities. Yet while these interventions are important, they do not address many of the barriers to accessing services faced by a patient in a low-income country.

III. METHODOLOGY

3.0 Study design

This research is a cross-sectional study. A combination of qualitative and quantitative data collection methods was used. In depth interviews and focused group discussions were conducted to both ANC attendees and providers at the public/private hospitals. A pre-tested questionnaire was administered to ten participants. After the pilot phase a semi-structured questionnaires were administered to ANC attendees on exit after receiving ANC services and ANC providers at the Clinic.

3.1 Study area

The study was carried out in Makeni city, Bombali District of the northern Sierra Leone and focuses on three hospitals/clinics (one government and two private). Currently, Bombali district has 16 community health centres (CHC), 18 community health posts (CHP), 48 maternal child health posts (MCHP), 1 government hospital, 1 military hospital, 1

community hospital, 3 mission Clinics, 3 mission hospitals and 3 private clinics. Endemic diseases are Yellow Fever and Malaria across Sierra Leone. The city had a population of 80,840 in the 2004 census and a current estimate of 112,489.

3.2 Sampling procedure

The study population comprised of mothers and pregnant women in the reproductive age group (15–49 years) seeking antenatal care services in Makeni city. Participants were purposively approached for selection from Makeni city. At hospitals/Clinic potential participants were selected systematically. Every second participant was approached for interview each working day of the week. A list of antenatal care attendees on a clinic day was prepared and a number assigned for each attendee. Attendees were picked at every third interval that is 3, 6, 9 until the required number of participants was reached. The same sampling procedure was used to come up with respondents for in depth interviews. A sample of 174 women from the ANC hospitals/clinic was selected (40 first trimesters and 134 late trimesters).

A semi-structured questionnaire focusing on demographic characteristics, socio economic indicators, knowledge of ANC, drugs administered to women and alternatives to ANC being undertaken in early phases of pregnancy was administered to the participants.

3.4. Focus group discussions (FGD)

Four Focus group discussions were conducted to seek opinions and knowledge on ANC practices in relation to new born health at the community and household levels. Participants included mothers, fathers and other community based caregivers. Group discussion were conducted focusing on the places where women go for antenatal care, when they go for antenatal care, alternatives to ANC mothers use in early phases of pregnancy, why they go for antenatal care, antenatal care services provided, medicine given during antenatal care, visits and changes the mothers feel should be done to improve antenatal care services and child management.

3.5 Data analysis

The list of indicators that were used included dependent variables such as first trimesters and late trimesters, independent variables included age, marital status, education, literacy among others. Social demographic characteristics of the sample were reported using descriptive statistics. Qualitative data from focus group discussions and key informant interviews were typed edited and entered into a computer and summarized.

3.6 Ethical considerations

Participants were asked for their consent to participate in focus group discussion and fill in structured questionnaire. But most importantly, the values and norms of the local people were studied well and respected to avoid any misconception and all the necessary permission from the university and the district authorities where the research was carried out.

The study covered a population of 200 respondents. To obtain data from the field a total of 174 questionnaires, 174 women from the ANC hospitals/clinic was selected (40 first trimesters and 134 late trimesters) but interviews and Focus Group Discussions (FDG) were also conducted. The four categories of respondents included; District health officials /providers, ANC attendees, Women and men in Makeni city.

For easy analysis and interpretation of data collected from the field, the data was captured in the different responses and categorized into different themes.

4.1 Social demographic characteristics of the respondents

This section focuses on both ANC providers and ANC attendees as the study set out to establish in terms of age, gender, and economic status, level of education, marital status, religion, and gravidity.

Table 1- 6: Socio-Demographic Characteristics of ANC attendees

The tables below demonstrate the socio-economic characteristics of ANC attendees in the government hospital and privates hospital/clinic.

Table 1 Age

Category	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
14-24	13	37	11	12	73
25-35	11	22	8	7	48
36-46	10	15	5	6	36
47- 57	-	10	5	2	17
	34	84	29	27	174

The majority of ANC clients were in the age bracket of 14-24 years (41.9%) and more ANC client attend Private clinics than the Government hospital (80.5%).

Table 2 Marital Status

Married status	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
Married	16	25	14	10	65
Single	9	41	10	7	67
Widowed	9	18	5	10	42
Total	34	84	29	27	174

Majority (38%) of the ANC attendees were singles, the study revealed that single status plays a significant role in determining women's utilization of ANC service. It was

IV. DATA PRESENTATION AND ANALYSIS

4.0 Introduction

discovered that most married women go for antenatal care early than single, widowed and divorced mothers.

Table 5 Income

Category	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
Low	19	48	19	15	101
Fairly high	15	36	10	12	73
Total	34	84	29	27	174

Table 3 Occupation

Category	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
House wife	13	37	11	12	73
Farmer	11	22	8	7	48
Petty Traders	10	15	5	6	36
Civil Servant	-	10	5	2	17
Total	34	84	29	27	174

The results show that majority of the women 42.0% were House wives, while 27.6% of the ANC attendees were farmers and their level of income was low. 20.7% were petty traders and only 9.8% of them were civil servants and none of them attend ANC at the Government hospital.

Table 4 Education

Category	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
None	12	38	12	12	74
Primary	19	29	9	7	64
Secondary	2	4	5	6	17
Tertiary	1	13	3	2	19
Total	34	84	29	27	174

74 respondents (42.5%) of the ANC attendee had no formal education while 9.8% had secondary education and 10.9% had tertiary education. This correlate to the number of civil servants and the income they earn. There was significant difference in proportion of the ANC attendees in the timing for antenatal care and use of other ANC alternatives in relation to literacy levels. The study findings revealed that, the low levels of education had significantly influenced the timing and utilization of ANC at health facilities.

The overall level of income of the ANC attendees was low (58.0%). This means that there are high poverty levels among women in the area of study which in one way or the other affects their ability to access and utilize ANC facilities that are in most cases located kilometers away from their area of residence. Level of income at a household was defined on the basis of one member having permanent job, engaged in small scale business and subsistence farming. Low income level households were those that depended on subsistence farming for their living. Households with a reasonable source of income were categorized as having fairly high income.

Table 6 Gravida

Category	Government n=34	Private Clinic 1 n=84	Private Clinic 2 n=29	Private Clinic 3 n=27	Total
Gravida 1-2	14	22	17	12	65
Gravida 3-4	9	30	10	8	57
Gravida 4 and above	11	32	2	7	52
Total	34	84	29	27	174

The majority of ANC clients were of gravidity 1-2 (37.4%). There were fewer respondents in the gravidity 4 and above (29.9%). The distribution of respondents by gravidity revealed that mothers with less gravidity (1-2) pregnancies start ANC early in pregnancy than those who have experienced more pregnancies.

All these contribute to limited ability to utilize ANC and therefore poor antenatal care seeking behavior. Education of the mother and that of members of the household were found to be significantly associated with the levels of utilization of ANC services.

Respondents reported having first attended an antenatal clinic during the second trimester of pregnancy, and had attended at least once before the third trimester. Some respondents whose first ANC visit was later than the second trimester, the reasons given for late attendance were: having had no problems during pregnancy and therefore no need to visit the clinic; a long distance to travel from home to the clinic, avoiding making many trips to the health facilities, and thinking they were earlier on in gestation than actually was.

Reasons	Frequency
Poor Quality	28
Myths and misconceptions	3
Traditional beliefs	8
Financial difficulties	86
Alternatives to ANC	12
Ignorance	32
Age	5
Total	174

4.2. Characteristics of ANC providers

The ANC providers were contacted during this study were 26 including the District medical officer, medical doctors, senior nursing officers, nurses and midwives offering ANC services in these hospitals/clinics.

Table 7: Social –demographic characteristics of ANC providers.

Variable	Male	Female	Total
Sex	10	16	26
Cadre			
Medical doctor	5	-	5
CHO	2	1	3
Public health Sister	-	2	2
Registered midwife	-	4	4
Registered nurse	1	5	6
SECH Midwife	-	1	1
SECHN	2	3	5
Total	10 (38.5%)	16 (61.5%)	26

According to the study findings, majority of the ANC providers were females (61.5%) and majority was nurses comprising 69.2% and had been in service for the period of 0-5years (47.1%). ANC providers had a positive perception towards antenatal care and were helping ANC seekers obtain the necessary services. However, ANC providers identified challenges of shortage of facilities and equipments necessary for ANC services.

4.3. Factors influencing Antenatal care late attendance

One of the objectives of the study was to determine reasons for ANC late attendance by pregnant women. To investigate the timeliness of ANC attendance, a categorization of 'early first attendance' was defined as a first visit to ANC at or before 4 months gestation, while those who made their visit after four months were categorized as late starters/beginners.

Through exit interviews with ANC attendees, participants from each group (early and late starters). The responses from both groups of ANC clients had knowledge about the dangers/disadvantages of starting ANC late in pregnancy. The study intended to establish why women sought ANC late. ANC providers and attendees gave the following views as the reasons why mothers seek ANC late:

Table 4: Reasons for late attendance Reasons mentioned by ANC providers and attendees for late attendance

4.3.1 Poor Quality of Care

Poor quality care at the health facility was mentioned by the respondents. The type and quality of antenatal care services that the women reported receiving were inconsistent and inadequate, and differed greatly from Ministry of Health. Fewer than half received any type of immunization services, and no hemoglobin tests, urine analysis, syphilis screening, or voluntary counseling and testing for HIV. Moreover, no counseling on risk factors and warning signs and symptoms during pregnancy were reported, and no adequate information related to delivery was given to women. In this regard one woman mentioned that, the reputation of nurses and midwives regarding care for delivering women was not good and as a result many women were scared of their bad behavior. Another significant finding from the study in relation to poor quality care was mistreatment by ANC providers, especially in government hospitals. With respect to delivery care, nearly most of the women were not satisfied with the care they received at their final place of delivery, because they reported health providers were rude and not treated well or were not treated in a timely manner.

The above findings contravene the fact that; every woman has the right to free health care and access high quality maternal health services that in turn must be accessible, affordable, effective, appropriate and acceptable to them in order to avoid preventable morbidity and mortality. Many complications of pregnancy and child birth that lead to mortality can be prevented by providing quality care that involves early detection of problems and appropriate timely interventions. Within the scope of this study, the researcher did not attempt to examine the quality aspect of ANC services for several reasons.

This again represents a significant discrepancy from the Free Health Care guidelines as providers are expected to develop delivery plans with the women during their first visit, and to review these plans in the third and fourth visits. The reasons offered by providers for these assessments included ; some women sought ANC services in the last days of their pregnancy which could not allow health workers draw delivery plans for them and even this made the risks higher.

4.3.2 Myths and misconceptions

The knowledge, perceptions and attitudes of ANC attendees were assessed. The study established that pregnant women and mothers had myths and misconceptions about seeking ANC early and in health units. The main reasons cited for failure to attend ANC early were based on the woman's own beliefs that the facilities would provide quality care, or on the advice given by family members.

Beliefs and attitude of mothers were yet another factor advanced by the respondents regarding ANC late attendance. As observed through the interviews, focused group discussions complimented by structured questionnaires, attitudes influence decisions on where and when to attend ANC. On the reasons why some mothers did not attend antenatal care services in health units; reasons such as smooth experience with previous pregnancies were given. This means that if nothing is changed, a

perceived negative attitude of health workers and poor quality of care would remain barriers to attending ANC early.

All of the ANC attendees and other women in the villages pointed out that the government facility health care providers are not polite in handling patients. They do not explain when doing procedures; misplace records and reject referrals sent by TBAs. This sometimes demoralizes some women. However, as reported by some women and ANC providers, such are misconceptions for there was no way a trained health provider would do such a thing.

However, this calls for supportive supervision to monitor service delivery standards and to ensure that abusive health workers are held accountable for mistreatment of clients. The study is not able to confirm independently the reports of negligence leading to abuse of patients at any point in the service delivery cycle. However, the negative experiences of women regarding the care they received and the belief among many participants that late attendance was caused by providers requires a thorough investigation into the quality of maternity services.

4.3.3 Traditional Beliefs and Practices

The study demonstrates that many women in the study area are still engulfed in the traditional past. The respondents' views revealed that many women seek ANC services late. ANC attendees and women reported that community norms were significant constraints in planning for early ANC and Facility-based delivery. Others even have the false belief that medical officials harass them. It was established that the status of women in the area of study was still low and they cannot make independent decisions about their health even when they have money and are aware of the advantages of attending ANC early. One respondent added that, heavy work load makes it impossible for pregnant women to start ANC before 5 months. It is a common practice that women go to the health facility if they have a problem that requires medical attention.

It was also reported that, some pregnant women feel shy and do not want anybody else to look at their private parts. They will deliver outside a health facility since they have heard or experienced the fact that health workers look at and touch their private parts when they go to deliver. In the focus group discussions it was found out that there are very few times when women's genitals are looked at either by herself or by other people during her life time as such even those that would wish to use health services take their time thinking about that.

4.3.4 Financial Difficulties

As established by the study, the level of income of the respondents based on their economic activities was so low. As a result their utilization of ANC facilities/services was reported to be minimal. It was established that, perceived expense of the ANC hinder early attendance, the respondents stressed that transport costs, physical inability to travel long distances make many women utilize the available ANC alternatives and visit health units late.

The fact that predisposing characteristics and enabling resources accounted more for the variation in pregnancy duration at entry to ANC than needs implied that inequality existed between women. Younger women, especially teenagers, are more

likely to have unplanned pregnancies and lack information and the resources to access ANC services.

Early entry to antenatal care (ANC) is important for early detection and treatment of adverse pregnancy related outcomes. The World Health Organization (WHO) recommends that pregnant women in developing countries should seek ANC within the first 4 months of pregnancy. However, due to financial constraints women tend to seek ANC in the seventh or even the ninth month of pregnancy.

In this study, majority of women complained of poverty and sometimes their finances being in the hands of their husbands while the widowed lacked control of property left to them. This reflects the real situation in the area of study.

4.3.5. Alternatives to ANC

The ANC providers indicated that some mothers undertake other alternatives in early phases of pregnancy. Some mothers use Traditional birth attendants and come for ANC in the seventh month—. As a result substantial proportions of women do not receive services offered by the ANCs such as breastfeeding and newborn counseling, malaria prevention and counseling on complications. Yet the ANC through the health care system remains the primary source of information about pregnancy and newborn care.

This survey provides missed opportunities on pregnancy programming and planning. It is clear that maternal mortality from within and without the health care system is not well addressed. The low ANC rate found in this survey is inconsistent even though many strategies have been laid by the government as well as District authorities. The research survey indicates the need to target outreach about the importance of ANC to those most at risk for not being aware of or able to access appropriate care. There is also need to focus on women with no formal education and particularly those who have already had lost a newborn or young infant.

Late ANC attendance does not provide women with a chance of benefiting fully from preventive strategies, such as iron and folic acid supplementation, and intermittent preventive malaria treatment in pregnancy among others. To encourage earlier ANC attendance, service delivery must be improved and messages that aim at removing barriers to ANC utilization should be increased.

4.3.6. Ignorance

The study established that, the majority of the respondents had less education levels which were also a reflection of the entire community. In this regard some ANC providers revealed that most of the women access antenatal late because of ignorance. Many mothers do not want to make many visits to the hospital/clinics. Thus they start ANC late to make fewer visits.

Because of the high illiteracy levels among women interviewed in the survey and generally among ANC attendees, there is need for outreach efforts by employing community engagement strategies, and counseling and educational materials used during ANC also need to be audio-visual, interactive and pictorial. This will enable the health providers to reach the uneducated women most at risk for not attending ANC or learning the details about assessing their own risk if they do not attend ANC early.

There have been many studies on factors relating to late entry to ANC in the world. The related factors include education. Due to the fact that many women are illiterate, they also have limited information on the dangers related to late entry to ANC. It was observed that there was also poor knowledge about ANC in the communities and the benefits are not easily appreciated. The main purposes of antenatal care are to prevent certain complications, such as anemia and identify women with established pregnancy complications for treatment or transfer. Antenatal consultations is said to provide opportunities for health education, health promotion and social support at both the individual and community level. Late attendance was reported to be as a result of ignorance about the values of ANC which demonstrates the weakness of government policy in promoting health and safe motherhood in the country.

4.3.7 Age

The results of the study indicate that ANC late attendance was associated with age. The frequency distribution of ANC attendees by gravida illustrated majority of the respondents were young mothers. 65 mothers were in 1-2 gravidity a likelihood of early marriages. Young mothers tend to go for antenatal care late for fear of being identified that they are young mothers by ANC providers and even in the community which puts their life at a risk. As reported by one nurse, many hospital deaths among pregnant mothers were due to age and mostly common in young mothers. Conversely, women with more previous pregnancies may be more confident because of their experience and they may also find it harder to attend ANC because of difficulties with child care.

4.4. Knowledge of mothers about benefits of attending ANC early

Data collected show high level of knowledge among ANC attendees. When prompted with a series of questions; of why mothers go for ANC, problems a mother may encounter when she does not seek ANC early, services offered when seeking ANC. The responses indicated that the respondents had knowledge about dangers a mother might come across when attended ANC late in pregnancy.

It is evident from the responses from both groups of ANC clients that their knowledge levels of the perceived benefits of starting ANC early are the same. The responses from the two groups were almost the same and they fell within the premises of the benefits/importance of starting ANC early. Therefore both the early and the late starters had similar knowledge on the benefits of starting ANC early in pregnancy.

4.5. Alternatives to ANC undertaken in early phases of pregnancy.

The study set out to establish whether there were alternatives used by pregnant women in the area of study. According to the respondents' responses, many pregnant women reported that indeed there were alternatives being undertaken by mothers and pregnant women in the area of study. ANC providers were asked to give their views about alternatives mothers try out in the early phases of pregnancy; their responses showed that mothers were trying out other alternatives before accessing antenatal care.

The study findings show that many mothers and pregnant women in the area of study use a number of alternatives during pregnancy. Respondents indicated use of TBAs and the use of herbs in the early phases of pregnancy.

4.5.1 Traditional Birth Attendants

The study established that TBAs are widely used by pregnant women and mothers in the study area. The study revealed that TBAs are appreciated in the community as they adhere to the norm of deliveries, always being an emergency in the community and that they act quickly and are always available.

The respondents mentioned visiting TBAs because they are nearer/closer to the mothers than ANC facility. The commonly cited reason for use of TBA's was the difficulty in transport that left mothers with no alternative but to use TBAs. The respondents added that TBA's were more accessible, and flexible enough to carry out a delivery in one's home than health units. However, some respondents raised concern that TBA's were incompetent and not well trained. TBA's also were known for not referring clients who failed to deliver and therefore contributing to high levels of deaths in the area of study.

The researcher observed that TBAs were also giving local herbs to their clients and they were not aware of most diseases common to mothers. This therefore identifies the need for TBAs to be informed about how certain diseases that are common among pregnant women and mothers occur and how they can be prevented and treated, since they demonstrated a high level of ignorance as regards dangers associated with failure to attend ANC early. Additionally, TBAs need to be informed about when and where to refer women in case of prolonged obstructed labor and other emergencies.

4.5.2 Use of herbs

The study findings indicated use of local herbs by most women in the area of study as an alternative to seeking ANC from health facilities. It was reported that, the majority of women and mothers take traditional medicine during pregnancy, labor, or delivery. These were taken orally and bath tonics. Some mothers bathe their children with herbs for the first two years. According to a nurse in a public hospital, women take herbs during pregnancy to prevent diseases, clean the baby in the womb, soothing body pains, treating malaria and prepare the mother for delivery by giving her strength and softening her pelvic bones. One woman in a private clinic reported that using traditional medicine such as local herbs helps in making one deliver normally.

There was a general feeling in the focus group discussions that women should use local herbs to help with minor problems during early pregnancy. However, it was observed that this prevents them from attending antenatal care during that period. Although some traditional practices and beliefs are fading away, most women believe in the use of traditional herbs which are given to them by the mothers-in-law, TBAs and older women in the community. The women and men do not see the need for going to ANC early when it is made safe by the herbs.

4.6. Distances to ANC health facilities.

Seeking and utilization of ANC services by pregnant women and mothers is determined by a number of factors of which distance and mode of transport is one of them. To establish what influences women to seek ANC alternatives and attend late, the researcher took the task of knowing how far the ANC attendees had traveled to the clinic/hospitals. The study findings on the availability and distances of antenatal care clinics revealed that women cover long distances to the health facility where antenatal care services are provided. This was expressed by respondents during questionnaire interviews, in depth interviews and focus group discussions.

4.7. The mode and means of transport used by ANC attendees

The majority of respondents indicated that they walk to antenatal care health facilities when they want antenatal care services.

Exit interviews with ANC attendees revealed that a bigger proportion of respondents had to walk to antenatal care hospital/facility. In depth interviews with ANC attendees, many mothers reaffirmed that they walk from their homes to hospital for ANC services or use a motor cycle (okada) for which they cannot afford hiring cost.

V. RESEARCH DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The results are discussed in line with the research findings as presented in chapter four.

5.1 Alternatives to ANC in Bombali District

The research findings show that; majority of the ANC attendees had other alternatives to ANC they were undertaking in their early phases of pregnancy. These included use of local herbs, traditional birth attendants and traditional healers. This implies that, cultural beliefs are still a determining factor to women's decision in seeking ANC services.

The study established ill treatment of ANC attendees by ANC providers. Some ANC providers are rude; abuse mothers and sometimes shout on them especially at that critical time when a mother is having labor pains. This demonstrated less ethical values among health providers. In addition research findings obtained, there was an observation some mothers seek ANC alternatives because the husbands were refusing to accompany or even block them from attending antenatal care. This was because some husbands are afraid of testing for HIV/AIDS and yet it is a requirement in all ANC facilities.

5.2 Antenatal Care late attendance

The study findings also illustrate that almost all of the respondents accessed ANC late in their fifth and sixth month contrary to the recommended 0-16 weeks by the Ministry of Health and Sanitation. There is evidence to suggest that mothers seek ANC late because of poverty. The study findings show that many of the respondents' income is low, so mothers fail to raise money for transport, lunch while on ANC visit and lack what to put on like maternity dresses and knickers. Thus some mothers

seek ANC late because the husbands cannot raise money for the wife to use going to Hospital/clinic.

The data obtained from the study show that distances from health units and hospitals contribute to mothers seeking ANC late. Many of the ANC health facilities are within a distance of over 5km to 10km. From data analyzed the biggest percentage of ANC attendees traveled longer distances to the hospital/health facility.

The findings indicated that women in the area of study are engaged in both in-home and tedious out-door farming activities for which they allocate little time for seeking medical care in general. A number of respondents attended ANC at least once before the third trimester of pregnancy and approximately half made their first visit early-during or before the fourth month of gestation, which is consistent with other reports of ANC attendance. However, no evidence was found of an association between early ANC attendance and uptake of intermittent preventive treatment, a key malaria preventive strategy. This suggests that efforts to encourage timely ANC attendance alone are unlikely to improve the uptake of this intervention.

However, the type and quality of ANC services that the women reported receiving were inconsistent and inadequate. Fewer than half received any type of immunization services, and a minority of women reported that the health worker listened for the fetal heartbeat. A few women had their blood pressure checked, were advised to eat a balanced diet, or were weighed. No hemoglobin tests, urine analysis, syphilis screening, voluntary counseling and testing for HIV, or counseling on risk factors and warning signs and symptoms during pregnancy were reported. The findings also suggest that other factors, aside from service availability, may drive service utilization differentials between and among rural women. These factors include disparities in economic and cognitive access, perceived quality of ANC services, and differences in individual knowledge and attitudes towards ANC services. A comprehensive conceptual framework of how different dimensions of access to and quality of health services affect service utilization in Bombali district. Such a framework should also take into account the emergence of non-public sectors that are increasingly involved in the provision of health services. A more comprehensive understanding of the service environment, consisting of all sectors and how different dimensions of service provision may affect utilization, will guide efforts to improve service utilization.

The study established that, late attendance was attributed to women seeking alternatives to ANC. This is a clear marker of how health and social systems threaten the capacity of women to deliver safely. While not attending ANC services as presented by the respondents, its true causes are grounded in women's acute socio-economic vulnerability which denies them access to timely and appropriate care. The severe shortage of qualified health workers, unavailability of transport to facilitate emergency referrals, searing poverty that denies people to afford health care; lack of education regarding basic reproductive health and the complications of childbirth. More tragically, however, lack of adequate ANC services has contributed to the continuing and unabated acceptance that women naturally die in childbirth, or are left with devastating disabilities.

Age was identified as a factor in ANC late attendance, slightly more than half of the women in the study whose age was reported were less than 30, and the majority of respondents were on their third pregnancy. The findings indicate the potentially serious health effects of early pregnancy. It also highlights the need for girls and young women to possess the fundamental rights to determine freely when they will marry and when they will begin having children. While it remains vital to recognize the severe impact of ANC late attendance on young girls, the findings expand on the widely held assumption that ignorance on seeking proper and adequate ANC services predominantly affects very young women on their first pregnancy.

The findings of the study highlighted that those women who are slightly educated have maximally availed delivery care services when compared to less educated and illiterate women. Significant differences have been observed according to women's education in consulting a health professional. Women with only primary and middle school education are less likely to see a professional in connection with their pregnancy and delivery. Attainment of education has a major influence on utilization of maternal health care services.

In terms of delivery assistance, antenatal checkup and place of delivery, there appears to be a big gap according to the women's standards of living. Women from poorer sections of the population are less likely to avail of maternal health care services than rich women. The reason might be that the cost of delivery care at private or public medical facilities is high. Poor families do not find themselves in a position to be able to bear the cost of delivery care service. Even if they wish to avail the public sector medical facilities, they have to bear the cost of medicines and are expected to give gift in kind or cash to the attending doctors and other paramedical staff.

A quick review of research findings shows that some pregnant women received antenatal care from health units. Paradoxically, when it comes to delivery time, a glaring smaller proportion of these women give birth in these units, instead they deliver elsewhere. The enthusiasm to establish why some women attend antenatal care in health units and fail to deliver in these same health units has not been carried out by the District health authorities. This calls for detailed study on what encourages mothers to go for antenatal care and not deliver from hospitals.

5.3 Respondents recommendations on how to improve ANC utilization

The study identified that it was significant to provide women with education and counseling on pregnancy, labor, and delivery. In particular, the danger signs of pregnancy and labor and the need for skilled delivery assistance should be emphasized. This means that Women in general should be encouraged strongly to deliver in a health facility so they can receive emergency care promptly when needed. Public education and programs to prevent women from seeking dangerous ANC alternatives must therefore, target all women of reproductive age. In particular, maternal health services should provide accurate and timely counseling to women as well as key decision makers, such as husbands, mothers-in-law and parents on the importance of utilizing ANC in early days of pregnancy and delivery, and encourage women and their families to have a birth plan in place as well as provisions for handling emergencies.

Training for health workers on clinical skills, as well as on client-provider interaction, was suggested as critical to ensure high quality, professional ANC and delivery services. Supplies and equipment must be available to health workers, and supportive supervision instituted to monitor service delivery standards. Health workers, in turn, need to be supported through training and supervision to provide essential, adequate, services to ANC attendees.

The Government should pursue its efforts to improve the availability of ANC services at existing and/or new health facilities, particularly those that are offering ANC services. Any interventions that aim to increase maternal health service utilization should include efforts to target women of lower health status and educational achievements, as well as areas where women in general do not have high educational achievements.

TBAs also need to be informed about how pregnancy complications occurs and how it can be prevented and treated, since there were many misconceptions about them by hospital and clinic workers. Additionally, TBAs need to be informed about when and where to refer women in case of prolonged obstructed labor and other emergencies.

Broad-based educational and advocacy programs are needed to dispel negative myths about seeking ANC at health units as well as to encourage social support for girls and women living with HIV to always visit health facilities. Consistent and reliable information on where and when services are available also needs to be disseminated to assist women to access treatment quickly.

By safeguarding maternal health and well-being the health, economic and societal benefits will be enormous, far outweighing any investments made. However, this requires strong political will and commitment.

From the findings, it is clear that ANC programs must address the reduction of maternal mortality from within and without the health care system. The low ANC rate found in the survey is an indication that, there is need for community outreaches about the importance of ANC to those most at risk for not being aware of or able to access appropriate care. There is also need to focus on women with no formal education and particularly those who have already had lost a newborn or young infant. Although the perceived expense of the ANC may hinder attendance, it is uncertain that free ANC would increase coverage substantially because transport costs, physical inability to travel long distances, and a perceived negative attitude of health workers and poor quality of care would remain barriers.

5.4 Conclusions

The health and survival of newborns has gone unnoticed for too long. However both immediate and long term opportunities exist to improve the situation at all levels. Existing policies and guidelines have not been fully disseminated, integrated or implemented by service providers, leading to poor and inconsistent utilization of ANC services especially in the areas of study. There is an opportunity for policy makers to take a leading role to improve utilization of ANC from the highest level in both public and private facilities. This can be achieved through making and disseminating appropriate policies, improving staffing and supervision in facilities and creating an enabling environment for community level care.

5.5 Recommendations

The study findings unveiled a number of gaps in the provision of ANC services and midwifery educational programs; gaps in information dissemination systems to pregnant women and structural and organizational barriers relating to accessibility of ANC services. Thus in order to change the habit of women seeking alternatives and attending ANC late, the study recommended thus;

5.5.1. Health workers should be encouraged to take opportunity of the numbers of mothers that attend ANC services and educate them on the unpredictability of complications of pregnancy and delivery.

5.5.2. Having realized the weaknesses in the health service in the District, there is need for training health workers providers in the concept of focused ANC, with specific emphasis on scheduling of visits, continuity of provider for each client, incorporating PMTCT and developing an Individual Birth Plan (IBP) to respond to existing knowledge gaps.

5.5.3. To improve women access and utilization of ANC services in these areas, there is need to establish or strengthen national policies and locally adapted guidelines to protect the rights of all women, regardless of their socioeconomic status or place of residence. There is a need for evidence-based guidelines at the national level detailing the essential minimum components of ANC, in line with the country epidemiological profile and country priorities and based on WHO guidelines and recommendations.

5.5.4. The study also recommends the need to strengthen the quality of ANC services by promoting evidence based guidelines and standards for focused ANC. This is because quality improvement approaches and tools help identify and overcome local constraints to providing client-orientated, effective ANC and ensure that women return after their first ANC visit.

5.5.5. The study suggests that strategies should be developed for empowering communities to overcome obstacles to reach ANC. These may include using community channels to identify pregnant women, targeting those more likely to be nonusers, such as adolescents and women who are poor and single, and making the services more responsive to the needs of women.

5.5.6. Quality and performance improvement to mitigate factors affecting performance of ANC providers were identified as a way of ensuring quality of ANC. This interdisciplinary approach should include key stakeholders, including district and regional health management teams, to identify service gaps. Based on the gaps identified, priority interventions should be implemented focusing on a range of performance factors such as supervision, knowledge and skills; development, and availability of key resources, supplies and equipment to ensure sustainability and long-term results.

5.5.7. The study established that many of the medical personnel handle their clients in an inhuman manner a sign of poor client handling. Training for health workers on clinical skills, as well as on client-provider interaction, is critical to ensure high quality, professional ANC and delivery services.

5.5.8. Continuous community based health education and facility-based education, peer group discussions in the

community and group education among pregnant women and mothers and at the same time raise the issue and discuss ANC and its advantages will help to create a sense of belongingness, build their consciousness to seeking health services.

5.5.9. Government should enforce on the free health care and also provide pregnant women with social and financial support, as well as transportation to health facilities. The need for women themselves to generate and save income for transport and delivery costs was also highlighted.

5.6.0. The study recommends an improvement in health care systems at all levels and improving maternal survival and well-being, through improving physical infrastructure, essential drugs supplies, equipment to improve the extremely difficult working conditions for staff and enable providers to offer quality care.

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The Utilization of Child Healthcare Services at the Ola during Children Hospital in Freetown

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Abstract- Given the magnitude of utilization of child health care services and the interventions available, much has not been done, most of these problems are silent. There remain, to a large extent, uncounted and unreported cases. Child health program should focus on addressing these problems and identifying cost-effective health-related program interventions that are likely to reduce child morbidity and mortality. This work having perceived this resilient silent crisis will cover socio-cultural factors which are discovered to be influencing the utilization of child healthcare services in the Sierra Leone society using “Ola During Children’s Hospital” as a case study and thus the research sought to assess the utilization of Child Health Care service at this Hospital in Freetown.

The research was a cross-sectional study; a combination of qualitative and quantitative data collection methods was used. In-depth interviews were conducted with 150 respondents of both child attendees and providers at the Ola During hospitals. The study findings on the availability and distances of child health care service revealed that women cover long distances to the health facility where child health care services are provided. This was expressed by respondents during questionnaire interviews, in depth interviews and focus group discussions.

The study revealed that majority; of 88.5% of the responses indicated that the respondents had knowledge about dangers a child might come across when attended hospital late during childhood illness. Most of the participants do not think it is necessary to bring their child for health service especially when the condition is not serious. The attitude of health care workers, the affordability, the satisfaction, and the distance are all factors contributing to the underutilization of the child health care. Most participants only visit when they are forced by relatives or when the condition goes worse. Thus in order to change the habit of those seeking alternatives, underutilization and attending child health care service late, the study recommended; making and disseminating appropriate policies, improving staffing and supervision in facilities and creating an enabling environment for community level care.

Index Terms- ARI -Acute Respiratory Infections, ART- Anti Retroviral Therapy , AVD-Assisted Vaginal Delivery, MCH-Maternal and Child Health, MCHP-Maternal and Child Health Posts, MOHS-Ministry of Health and Sanitation, Ola During Children’s Hospital

I. INTRODUCTION

T1.1 GENERAL BACKGROUND INFORMATION: CONCEPT OF CHILD HEALTH CARE

The Government of Sierra Leone through Ministry of Health and Sanitation (MoHS) has developed ambition health policy and strategic plan to improve the health and wellbeing of Sierra Leoneans in the country. To effectively and efficiently implement the policy and strategy plan, the MoHS works with partners to invest in health inputs – from staff to supplies; from infrastructure to information systems. These inputs lead to immediate outputs, such as increasing the numbers of patients seen and treated, and these outputs lead to improved health outcomes in specific areas. The impact of Health service on the livelihood on the people indicates that all the different sub-sectors are performing. Reduced infant mortality is a performance indicator of not only on the quality of child health services at health facilities, but also performance across WASH, nutrition and malaria; and maternal mortality as well as maternity services, nutrition and HIV/AIDS services in terms of prevention of mother-to-child transmission.

According to WHO (2008), underutilization of maternal healthcare contributed to death and illness of women during pregnancy, childbirth and postnatal period. These have cost implications for family and the community because of high direct and indirect costs, the adverse impact on productivity and the tremendous human tragedy that every maternal or child death represents. It does not only contributed to the persistent poverty, lack of empowerment and loss of employment, leading to poor income among women of child bearing but also have huge costs impact on families in emotional, health and economic terms (Hauwa, 2011). The most tremendous impacts occur when a woman dies in childbirth, which can affect her children’s wellbeing and schooling.

Sierra Leone has a population density of approximately seven (7) millions people in a geographical landscape of 7, 1740 square kilometre. From 1991 to 2001, the country suffered a severe brutal civil war which resulted into to the destruction of both human lives and infrastructures in the entire country. The Government of Sierra Leone developed ambition policies and programmes to addressing poverty in the country, including health services delivery initiatives commonly known as Free Health Care Services to most vulnerable group like Under Five children, pregnant women and lactating mothers with principal goal to reduce maternal, child and infant deaths.

On the 24th of May 2014, the director of disease control declared an outbreak of the world worst deadly and notorious Ebola virus of haemorrhagic genus in Sierra Leone which spread geometrically in the entire country. Prior to the epidemic of Ebola Disease in Sierra Leone, the country has been characterised by weak and fragile health system in term of man power, logistic and finance. A major focus after the outbreak was reducing child and maternal mortality and morbidity, for which the Expanded Programme on Immunization continued to be a backbone and an important entry point for broader integrated primary health care. In the same development platform, WHO and other health-related partners have supported the MoHS in rolling out the Integrated Management of Newborn and Childhood Illness (IMCI) programme as well as conducting pilot Emergency Obstetric and Newborn Care (EmONC) training sessions, and the national program of Nutrition has also been of critical importance.

In most developing countries like Sierra Leone, access to and utilization of Child health care services in rural areas is more limited than in urban areas. In Sierra Leone, the government has put in place health centers equipped with Community Health workers, trained nurse and mid-wives in all chiefdoms. Maternal and child healthcare system is an important segment of medical system in every society. This is as a result of large number of human population involved in this health sector, coupled with the significance of this group to the overall sustenance of the human population. It is also noticed that this sector of medical system is affected by less difficult health problems, which are usually preventable. Similarly, the increasing wave of gender equality has significantly stimulated attention towards the study of women and children. It is in the light of these, that this sector has attracted overwhelming attention especially from health related researchers, health providers, and health implementers (Kerberet *et al.*, 2007).

Maternal health is the health of women during pregnancy, childbirth, and postpartum period. It encompasses the health care dimensions of family planning, preconception, prenatal, and postnatal care in order to reduce maternal morbidity and mortality (WHO, 2008). Maternal health (MH) is important to communities, families and the nation due to its profound effects on the health of women, immediate survival of the newborn and long term well-being of children, particularly girls and the well-being of families. The improvement in maternal health has become a long term effect on creating healthy generation because women have a key role in the rearing of children and the management of family and community affairs (WHO, 2008). According to World Bank, 2009 maternal health indicators reflect not only how well the health system is functioning, but also the degree of equity in public service delivery, utilization of services, and the social status of women.

In industrialized countries of the world, an appreciable success has been attained in reduction of morbidity and mortality affecting the lives of both the mother and the child (Price, 1994). Whereas in less industrialized countries of the world, despite all the attempts to reduce the severity of child healthcare problems, it still remains a scourge which continues to claim the lives of a large percentage of their populations.

More than 150 million women become pregnant in developing countries each year and an estimated 500,000 of them

die from pregnancy-related causes. Utilization of Child Health Care is also the causes for more than seven million under-fives or infant deaths within the first week of life. Lack of proper Child Health Care has a further impact by causing grave economic and social hardship for family and community. Other than their health problems most children in the developing countries like Sierra Leone lack access to so many other facilities/services and increase the magnitude of death from preventable problems.

The major determinants of utilization of Child Health Care and mortality include pregnancy, the development of pregnancy-related complications, including complications from abortion and, the management of pregnancy, delivery, and the postpartum period. However, a lot of factors contribute to the low health status of under-fives children in the developing countries including Sierra Leone. These factors include: Socio economic development of the country has serious Impact on morbidity and mortality. Infant death often has a number of interlined causes, which may start as early as birth or in early childhood.

Lack of access to modern health care services has great impact on increasing death rate among children.

Culture, belief systems and economic conditions are vital factors in determining health utilization services which can form the major concern of those who formulate and implement government health policies. The role which belief system, understanding the concept of disease, illness and health, improvement in the socio-economic status of the people and well planned education can all help in ensuring maximum and most efficient utilization of the health services. Communities on their own part should encourage their members to appreciate health facilities, provided by the government and utilize them. In order to combat the problem of child mortality and morbidity, the standard of living of the Sierra Leonean populace must be raised. Extreme poverty is not only the source of disease and mortality, but it is also one of the chief causes of bottleneck in public health delivery in Sierra Leone.

Performance across key maternal health indicators such as coverage of antenatal care and postnatal care services remains strong, though with a slight fall from 2015 and marked variability across districts. Family planning coverage has improved, and following a dip in performance in 2015, immunisation coverage rates have once again increased in 2016. However, the key story for Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCAH) is that despite excellent coverage rates, particularly compared to its peers, Sierra Leone continues to lag far, far behind in maternal, infant, and child mortality. This points to an issue of poor quality service delivery, and this needs to be the focus of attention for the MoHS going forwards (MOHS, 2016).

Additionally, viewing RMNCAH outcomes as a consequence of not only service delivery but also key preventative interventions such as nutrition, water, sanitation, and hygiene (WASH), and malaria prevention will be key to developing the joined-up strategic planning necessary to reduce the number of maternal and child deaths in the country. Given this background, this study focused on the perception of child health care services utilization and the factors that influence the utilization of child health care services.

1.2 STATEMENT OF RESEARCH PROBLEM

The persistent high occurrence of child morbidity and mortality especially in Sub-Saharan African societies still reflects that much ground is yet to be covered on child healthcare. The study therefore, investigates the socio-cultural factors that influence the utilization of Child Health Care Services. Many Sierra Leoneans especially indigenes and residents of rural communities survived to adulthood, while on the average, fifteen pregnancies for a Sierra Leonean woman would produce seven normal deliveries. Some of them, who managed to survive, had abnormal growth due to inadequate nutrition which results to failure to thrive and stunted growth. Their health ecology was too disturbing to the overall health development. This situation was as a result of inadequate knowledge of maternal and child health care, which ushered in various controllable infectious diseases.

There is a great need for revitalization of Primary Health Care (PHC) in Sierra Leone. PHC is a fundamental means of responding to the community's need for health services. It ensures community participation in planning and implementing their own healthcare, generating health awareness, mobilizing the community and preventing infections. This integrated approach is a deserving solution to child health problems in the slum communities in Sierra Leone. Sierra Leone is facing serious challenges in delivering health care services. In 2008, the life expectancy was 48 years, infant mortality rate 89 per 1000 live births, "under five" mortality rate 140 per 1000 live births and maternal mortality ratio 857 per 100,000 live births.

The country has a poor health status mainly due to a high disease burden caused by environment related communicable diseases and aggravated by poor nutrition. Malaria (38%), acute respiratory infection (16.9%) and watery & bloody diarrhoea (9.7%) are the top most causes of outpatient attendance, together accounting for about 65%. Although stunting prevalence in under-fives has decreased from 40% in 2005 to 36.4% in 2018 and 37.7% in 2014, poor nutritional status is still a public health problem (MOHS, 2016).

The above-mentioned three diseases together with malnutrition account for about 70% of under-five consultations. Although the under-fives constitute about 17% of the population, they make up 49% of consultations at peripheral health units (PHUs). Malaria is endemic in the Sierra Leone and affects the whole population, but children under five years and pregnant women are most vulnerable with high morbidity and mortality rates. The country also, from time to time, experiences outbreaks of the following epidemic prone diseases: Cholera, Yellow fever, Shigellosis, Lassa fever, Measles and Meningitis, (MOHS, 2016).

An effective evaluation system has not been institutionalized till today. From this backdrop some questions may subsequently arise in the mind of a health practitioner: Does the existing decision making not promote Child Health Care? Does the development project undertaken ignore promoting quality health service delivery to the more vulnerable? What are the factors that affect these? The present study is an endeavor to look through these pertinent questions.

1.3 JUSTIFICATIONS OF THE STUDY

Why should the care of children needs major consideration and be part of every program that is taking care of people's health? Children make up over 2/3 of the whole population, 4.5%. Most children in the developing countries like Sierra Leone receive insufficient or no health and are believed to result in to health problems subsequently it leads to death.

Between 1993 and 1999 when the country faced serious economic decline and political, coupled up with the Ebola epidemic in 2014 destabilized micro-economic policies. Under-five mortality rate moved from 130-194 deaths per 1000 live births. All these affected under five children (WHO, 2007 and The World Fact Book, 2010). Therefore, this work having perceived this resilient silent crisis will cover socio-cultural factors which are discovered to be influencing the utilization of child healthcare services in the Sierra Leone society using Ola During Children's Hospital as a case study.

Given the magnitude of these problems and the interventions available, much has not been done. Most of these problems are silent. They remain, to a large extent, uncounted and unreported. Child health program should focus on addressing these problems, clarifying policy and program alternatives and identifying cost-effective health-related program interventions that are likely to reduce child morbidity and mortality.

These outlined issues do not only show the importance of Child health care to the immediate problems. Rather, they show the role and it necessity in the welfare of the family, the community and the country as a whole.

1.4 AIM AND OBJECTIVES OF STUDY

1.4.1 Aim of Study

The ultimate goal of this study is to assess the utilization of Child Health Care service at the Ola During Children Hospital in Freetown.

1.4.2 Objectives of Study

- i. Examine the socio-demographic characteristics of the respondents;
- ii. Highlight the socio-cultural factors influencing the utilization of child health care services in the study area;
- iii. Assess the level of the quality of health care delivery and free treatment to the less privileged neonatal (zero to twenty-eight days old babies) and the Under-Fives (twenty-eight days to five years old);
- iv. Identify the major issues and causes that affect the free health care delivery;
- v. To determine the health service impact in terms of preventing child morbidity and mortality.

1.5 SIGNIFICANCE OF THE STUDY

The government through MOHS and its partners has invested huge amount of money in order to improve health service delivery in post-war and post-Ebola. Health service initiatives which have high impact and cost effective, including primary care service delivery mechanism aimed to scale up health services rapidly, sexual and reproductive and child health services, water and sanitation, utilization of treated bed nets and promotion of early and exclusive breastfeeding; family planning

to address problems of teenage pregnancies and child marriage; essential and emergency obstetric care, including prenatal, delivery and post-natal services; integrated management of neonatal and childhood illnesses; preventive services, including immunization and school health; and promotion of hygiene practices and further reduce high child and maternal mortality and morbidity in the country.

Despite these ambitious interventions, there has been high increase in the morbidity and mortality trends of many diseases. Against this background, the report of this research will be significant to MOHS, partners, private and other health-research demanded persons and institutions to fully understand the predisposing factors which are undermining beneath development of Sierra Leone health service delivery performance. It will be useful as a good document, reference, for libraries, researchers, and other related learning institution as a basis for literature review reference.

1.6 ORGANIZATION OF THE STUDY

Ministry of Health and Sanitation is the government leading agency responsible for health service delivery in Sierra Leone. During the course of the study, literature regarding health service delivering, operation tools and document, qualification of staff and quantity and quality of health commodities supply to the health facility will be reviewed, while the perception of health workers and beneficiaries will be assessed to help improve the study.

II. 2.0 LITERATURE REVIEWS

2.1 INTRODUCTION

The Centre objective of this chapter is to review relevant literature laying premium on the utilization of Child Health Care. This work aims to strengthen the realization and utilization of Child Health Care in Sierra Leone with specific reference to Fourah Bay Community as case study. It has become necessary to examine Child Health Care within Sierra Leone's socio-cultural milieu and to observe how these are affecting the overall development process. The government's initiative to provide free quality health care to all under-fives all over Sierra Leone falls within government's overall development plan for the nation. The research has found that recent efforts to promote this through policy and targeted programs for women/children at the grass roots has been thwarted by a severe deficiency in financial and human resources, poor communication network, high illiteracy rate among, corruption, politics of ethno-regional segregation and the lack of a mechanism for enforcing legislation.

Child health care is one such service and despite its health worker plays a key role in delivering the services. Health workers are expected to make regular examination and monitor various aspects of the health of women and children, provide information related to health and deliver other selected services.

The reason for concern becomes evident when we consider the results of a study by Bloom *et al.* (1999) in the urban areas of the state of Uttar Pradesh which showed that women with a high level of antenatal care had four times higher estimated odds of using trained assistance at deliveries than that for women with lower levels of care. In context of the policy change mentioned earlier, there is little policy focus on how to

target secluded women; health workers are not well-informed about reproductive morbidity, and they are unaware of the many perceptions, beliefs and attitudes that need to be addressed in order to improve the compliance from and confidence of their clients. Thus, health workers seem not to be asking the right questions, and fail to recognize symptoms (Jejeebhoy *et al.*, 1999). Finally, women are sometimes hesitant to use public health facilities because of absence of lady doctors and female attendants. Yet other studies indicate that while women indeed prefer lady doctors, they are not rigid about these preferences (Sharma, 2003).

The unhygienic conditions in which rural deliveries often occur lead to infection in many mothers and newborns (World Bank, 1996). Many women do not go to health facilities because they feel that it is unnecessary or their socio-economic status is a hindrance. However, in many cases it is the lack of appropriate facilities which is a hindrance. In the India Facility Survey (2003), it was found that in UP, Rajasthan and Orissa, a labor room was available in less than half the Primary Health Centers (PHCs) surveyed, and emergency drugs (that should be available) for managing labor were available in less than 5% of the PHCs (Das, 2006).

2.2 HIGHLIGHT THE SOCIO-CULTURAL FACTORS INFLUENCING THE UTILIZATION OF CHILD HEALTH CARE SERVICES

One of the most disturbing child health components in India is low and falling child immunization levels. While few studies have attempted to explain this in a systematic way (Audinarayana, 1987), many children do not receive full immunization because of socio economic barriers and supply side factors. We should be concerned at the low adoption rates of family planning methods. Immunization of children in India declined sharply from an already low 52% in 1998-99 to 44.6% in 2002-03 (Patnaik, 2006). Beyond population control, we must remember that there is a strong link between immunization and adoption of a family planning method since parents who expect that their children will be healthy, and live longer, are also more likely to adopt family planning methods (Baiet *et al.*, 1978).

We now turn to the more common explanations for low Child health care services utilization which fall under the domain of socio-economic factors. Majority of Sierra Leonean women are illiterate, poor, and live in rural areas and this has a negative impact on demand for Child health care services. In addition, women have little decision-making power. Various studies also show that the attitude of men, especially husbands in the case of married women, can be critical; and, husbands are usually found wanting when it comes to supporting their wives (Singh *et al.*, 1998). A study in Tamil Nadu by Kavitha and Audinarayana (1997) revealed that controlling for other variables, respondents education exhibited significant positive effect on the use of antenatal and natal health care services. The same study also revealed that higher caste women were more likely to use antenatal and post-natal check-ups compared to lower caste women. The results from the study by Kavitha and Audinarayana have also been validated by other studies. Govindasamy and Ramesh (1997) found that benefits of maternal education persist even after accounting for other socioeconomic factors (income, rural/urban, North India/South India).

This research has thus revealed the gap between policy and implementation at the grass root level. Healthcare is the maintenance or improvement of health via the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings. Healthcare is delivered by health professionals (providers or practitioners) in allied health professions, chiropractic, physicians, physician associates, dentistry, midwifery, nursing, medicine, optometry, pharmacy, psychology, and other health professions. It includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health.

2.3 THE QUALITY OF HEALTH CARE DELIVERY AND FREE TREATMENT TO THE LESS PRIVILEGED NEONATAL (ZERO TO TWENTY-EIGHT DAYS OLD BABIES) AND THE UNDER-FIVES (TWENTY-EIGHT DAYS TO FIVE YEARS OLD)

Access to health care may vary across countries, groups, and individuals, largely influenced by social and economic conditions as well as the health policies in place. Countries and jurisdictions have different policies and plans in relation to the personal and population-based health care goals within their societies. Healthcare systems are organizations established to meet the health needs of target populations. Their exact configuration varies between national and sub national entities. In some countries and jurisdictions, health care planning is distributed among market participants, whereas in others, planning occurs more centrally among governments or other coordinating bodies. In all cases, according to the World Health Organization (WHO), a well-functioning healthcare system requires a robust financing mechanism; a well-trained and adequately paid workforce; reliable information on which to base decisions and policies; and well maintained health facilities and logistics to deliver quality medicines and technologies.

Neonatal care is receiving more attention as greater progress is made in reducing the burden of disease among older children and as more information is available on the burden of neonatal disease and interventions that can effectively reduce this burden. Most, interventions aimed at decreasing neonatal mortality are linked to prenatal and maternal care intervention. The interventions that are aimed at reducing childhood mortality beyond the neonatal period are typically delivered via public health programs that we generally think of as more classic public health delivery methods for instance immunization.

Causes of death also vary from region to region, district to district, for example, Malaria is responsible for 7% of childhood deaths globally, however, it can be the leading cause of childhood death in some endemic Africa countries like Sierra Leone. Proportional mortality data can be misleading if caution is not used in interpretation. We often use pie chart to visually display causes of death as percentages meaning proportional mortality. Remember proportional mortality only tells you what percent of deaths are due to a certain cause, it does not tell you about disease incidence or prevalence and it is not the same as cause specific mortality rates. A disease can kill as many people, but may result in a lower proportional mortality rate because there are so many death dues to other causes. Children are always among the most heavily affected by armed conflict either directly

or indirectly. Even if they survive the bullets, they are often subject to violence or being orphaned. The destruction wrought by war disrupts social services such as education and health care. In the eleven years rebel war coupled with the Ebola and mudslide disaster in Sierra Leone the “under Five” mortality rate increased by 13% and adult mortality by even more, the aftermath is still evident after they ended; during the first five years of peace, the average “under Five” mortality rate remains 11% higher than it corresponding level before the conflict. Lack of access to modern health care services has great impact on increasing death rate among children within the ages of 0-11 years old. Most children do not receive postnatal care; etc. Less than 10% of children in Sierra Leone get less food that contains all the six classes of food for healthy living of a child.

Health care is conventionally regarded as an important determinant in promoting the general physical and mental health and well-being of people around the world. An example of this was the worldwide eradication of smallpox in 1980, declared by the WHO as the first disease in human history to be completely eliminated by deliberate health care interventions. The delivery of modern health care depends on groups of trained professionals and paraprofessionals coming together as interdisciplinary teams. This includes professionals in [medicine](#), psychology, [physiotherapy](#), [nursing](#), [dentistry](#), [midwifery](#) and [allied health](#), plus many others such as public health practitioners, community health workers and assistive personnel, who systematically provide personal and population-based preventive, curative and rehabilitative care services.

2.4 CHILD HEALTH CARE SERVICES IDENTIFY THE MAJOR ISSUES AND CAUSES THAT AFFECT THE FREE HEALTH CARE DELIVERY

Children differ from adults in at least four important ways: 1) developmental change; 2) dependency on parents and other caregivers; 3) differential epidemiology (e.g. different health, illness and disabilities); and 4) demographic patterns (e.g. socio-economic determinants) (Forrest *et al.*, 1997). Children’s use of health services is different to other age groups, for example the rate of acute, short-stay hospital admissions in children is higher, and rising (Saxena *et al.*, 2009). Children may need to be transitioned from paediatric to adult services, and have constantly changing needs in relation to their developmental stage and age (Wolfe and McKee, 2013). Education is especially important, rather than social care, and there is a greater dependence on the family than social care, compared to adults (Wolfe *et al.*, 2016). There is an opportunity to prevent physical and mental ill health in adult life by improving the health (Marmot, 2010)

The 2015 Quality Watch Annual Statement (Health Foundation and Nuffield Trust, 2015) summarized the state of quality of care for children based on a number of indicators that can be monitored over time, including health promotion/prevention, and care for children with acute, chronic and mental health conditions. It found that there has been improvement in some areas that are affected by broader societal trends (for example the conception rate for under 18-year-olds or the proportion of women who smoke at birth). However, in 2014/15 nearly 22 per cent of children in reception class (aged 4–5 years) and one in three children in year 6 (aged 10–11 years)

were overweight or obese. Between 2006/07 and 2014/15 the proportion of children in reception who were obese declined from 9.9 per cent to 9.1 per cent, but the proportion of children in year 6 who were obese increased by 1.6 per cent (Health and Social Care Information Centre, 2015a). Unplanned hospitalizations for long-term conditions (diabetes, asthma, epilepsy and convulsions) in people under 20 declined between 2003/04 and 2013/14, suggesting better management of these children in the community, as highlighted by epilepsy and diabetes audits (Royal College of Paediatrics and Child Health, 2014 and 2015). However, the rise in emergency admissions for children with lower respiratory tract infections, as well as unplanned hospital admissions for children due to ear, nose and throat infections, is of particular concern. These trends suggest a need to better understand how acute conditions are managed in primary and secondary care.

With respect to morbidity as measured by disability-adjusted life years (DALYs) 1 per 100,000, based on data from the Global Burden of Disease study (Institute for Health Metrics and Evaluation, 2013), for children under the age of five, the UK continues to perform poorly compared to similar countries. However, in the older age groups, where there is also less variation between countries, the UK does well and has the lowest DALYs per 100,000. In 2013, in the UK, the largest burden of disease for children under the age of five was due to preterm birth complications (26 per cent) and congenital anomalies (22 per cent). For children aged 5–14 the largest burden of disease was due to mental health conditions (19 per cent) and nutritional deficiencies (19 per cent), and for the older children (aged 15–19) it was again due to mental health conditions (31 per cent), followed by back and neck pain

2.4.1 Kinds of Health Care Services: The [emergency room](#) is often a frontline venue for the delivery of primary medical care.

2.4.2 Primary care: Refers to the work of health professionals who act as a first point of consultation for all patients within the health care system. Such a professional would usually be a primary care physician, such as a general practitioner or family physician, a licensed independent practitioner such as a [physiotherapist](#), or a non-physician primary care provider (mid-level provider) such as a physician assistant or nurse practitioner. Depending on the locality, health system organization, and sometimes at the patient's discretion, they may see another health care professional first, such as a pharmacist, a nurse, a clinical officer (such as in parts of Africa), or other traditional medicine professional. Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

Primary care is often used as the term for the health care services which play a role in the local community. It can be provided in different settings, such as Urgent carecentres which provide services to patients same day with the appointment or walk-in basis.

Primary care involves the widest scope of health care, including all ages of patients, patients of all socioeconomic and geographic origins, patients seeking to maintain optimal health, and patients with all manner of acute and chronic physical, [mental](#) and social health issues, including multiple chronic

diseases. Consequently, a primary care practitioner must possess a wide breadth of knowledge in many areas. Continuity is a key characteristic of primary care, as patients usually prefer to consult the same practitioner for routine check-ups and preventive care, health education, and every time they require an initial consultation about a new health problem. The International Classification of Primary Care (ICPC) is a standardized tool for understanding and analyzing information on interventions in primary care by the reason for the patient visit.

Common chronic illnesses usually treated in primary care may include, for example: hypertension, diabetes, asthma, COPD, depression and anxiety, back pain, arthritis or thyroid dysfunction. Primary care also includes many basic maternal and child health care services, such as [family planning](#) services and vaccinations. In the United States, the 2013 National Health Interview Survey found that skin disorders (42.7%), osteoarthritis and joint disorders (33.6%), back problems (23.9%), disorders of lipid metabolism (22.4%), and upper respiratory tract disease (22.1%, excluding asthma) were the most common reasons for accessing a physician.

In Sierra Leone, primary care physicians have begun to deliver primary care outside of the managed care (insurance-billing) system through direct primary care which is a subset of the more familiar [concierge medicine](#). Physicians in this model bill patients directly for services, either on a pre-paid monthly, quarterly, or annual basis, or bill for each service in the office. Examples of direct primary care practices include Free Health Care System.

In context of global population aging, with increasing numbers of older adults at greater risk of chronic non-communicable diseases, rapidly increasing demand for primary care services is expected in both developed and developing countries. The World Health Organization attributes the provision of essential primary care as an integral component of an inclusive primary health care strategy.

2.4.3 Secondary care: includes [acute care](#): necessary treatment for a short period of time for a brief but serious illness, injury or other health condition, such as in a hospital emergency department. It also includes skilled attendance during [childbirth](#), intensive care, and medical imaging services.

The term "secondary care" is sometimes used synonymously with "hospital care". However, many secondary care providers do not necessarily work in hospitals, such as [psychiatrists](#), clinical psychologists, occupational therapists, most [dental specialties](#) or [physiotherapists](#) (physiotherapists are also primary care providers, and a referral is not required to see a physiotherapist), and some primary care services are delivered within hospitals. Depending on the organization and policies of the national health system, patients may be required to see a primary care provider for a [referral](#) before they can access secondary care.

For example, in Sierra Leone, which operates under a [mixed market](#) health care system, some [physicians](#) might voluntarily limit their practice to secondary care by requiring patients to see a primary care provider first, or this restriction may be imposed under the terms of the payment agreements in private or group [health insurance](#) plans. In other cases, medical specialists may see patients without a referral, and patients may decide whether self-referral is preferred.

2.4.4 Tertiary care: is specialized consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced [medical](#) investigation and treatment, such as a [tertiary referral hospital](#).

Examples of tertiary care services are [cancer](#) management, neurosurgery, cardiac surgery, plastic surgery, treatment for severe burns, advanced neonatology services, palliative, and other complex medical and surgical interventions.

2.4.5 Quaternary care: is sometimes used as an extension of tertiary care in reference to advanced levels of medicine which are highly [specialized](#) and not widely accessed. [Experimental medicine](#) and some types of uncommon [diagnostic](#) or [surgical](#) procedures are considered quaternary care. These services are usually only offered in a limited number of regional or national health care centers. This term is more prevalent in the United Kingdom, but just as applicable in the United States. A quaternary care hospital may have virtually any procedure available, whereas a tertiary care facility may not offer a sub-specialist with that training.

2.5 HOME AND COMMUNITY CARE

Many types of health care interventions are delivered outside of health facilities. They include many interventions of [public health](#) interest, such as [food safety](#) surveillance, distribution of condoms and needle-exchange programs for the prevention of transmissible diseases. They also include the services of professionals in residential and community settings in support of self-care, home care, long-term care, assisted living and treatment for substance use disorders and other types of health and social care services. Community rehabilitation services can assist with mobility and independence after loss of limbs or loss of function. This can include [prosthesis](#), [orthotics](#) or [wheelchairs](#). With obesity in children rapidly becoming a major concern, health services often set up programs in schools aimed at educating children in good eating habits; making physical education compulsory in school; and teaching young adolescents to have positive self-image.

Many countries, especially in the west are dealing with aging populations, and one of the priorities of the health care system is to help seniors live full, independent lives in the comfort of their own homes. There is an entire section of health care geared to providing seniors with help in day-to-day activities at home, transporting them to doctor's appointments, and many other activities that are so essential for their health and well-being.

Culture, belief systems and economic conditions are vital factors in determining health utilization services which can form the major concern of those who formulate and implement government health policies. The role which belief system, understanding the concept of disease, illness and health, improvement in the socio-economic status of the people and well planned education can all help in ensuring maximum and most efficient utilization of the health services cannot be over emphasized. Communities on their own part should encourage their members to appreciate health facilities, provided by the government and utilize them. As observed in all cultures, each society has its peculiar way of dealing with bio-cultural problems

affecting its human population. Responses to various interventions seem to differ considering the peculiar knowledge displayed by the population in each society. Environmental factors also play considerable role on the health seeking strategies, thereby making the health interventions and responses greatly different across the culture (Jegade, 1999).

In order to combat the problem of maternal and child mortality and morbidity, the standard of living of the Sierra Leonean populace must be raised. Extreme poverty is not only the source of disease and mortality, but it is also one of the chief causes of bottleneck in public health delivery in Sierra Leone. In industrialized countries of the world; an appreciable success has been attained in reduction of morbidity and mortality affecting the lives of both the mother and the child (Price, 1994). Whereas in less industrialized countries of the world, despite all the attempts to reduce the severity of maternal and child healthcare problems, it still remains a scourge which continues to claim the lives of a large percentage of their populations (WHO, 2007 and 2010; and The World Fact Book, 2010).

2.6 EXPLORING THE BUSINESS CASE FOR IMPROVING THE QUALITY OF HEALTH FOR CHILDRENE EXAMINE THE SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Until recently, support from the Commonwealth Fund, members of the Child Health Business Case Working Group considered the unique features of children's health care in their article, (*Health Affairs*, 2004). In many cases, improvements to health care yield benefits to society. Financial benefits, however, have been difficult to demonstrate for the organization investing resources. In examining five hypothetical quality improvement programs aimed at children's health care, the authors find that many of the same impediments to securing a financial return on investment lack of quality-based provider incentives and "displacement" of payoffs in time or place, for example affect quality improvement in similar ways for both adults' and children's care. But other barriers are unique to care for children, they say. These additional obstacles must be overcome, the authors argue, to clear the way for broad-based improvements in the care provided to children and adolescents.

A significant amount of literature talks about the influence of, and what shapes, attitudes and awareness. Rani and Bonu (2003) identify religion as a potential influence on seeking care. However, the effects of religion may be difficult to establish as religion and economic status often go together. Irrespective of religion or caste issues, pregnancy is often not considered as a problem that is worth seeking care for. Thus, pregnant women receive little additional food and often no medical attention, even when complications arise (World Bank, 1996). While the socio-economic factors still have an important role in explaining low Child Health services utilization, studies are now indicating that people in general, and mothers in particular have been coming forward to utilize the child health care services irrespective of their socioeconomic background (Audinarayana, 1987). This is also reflected in the increasing involvement of the private sector as indicated in a study by Rani and Bonu (2003) which reveals that though socially disadvantaged women are less likely to consult private providers, majority of the poorest, uneducated

and lower caste women will consult private providers (which are usually more expensive than government facilities).

Previous research indicates that investing in supply-increasing interventions such as expanded service delivery does not necessarily increase use of services (Hjortsberg, 2003; Thaddeus and Maine, 1994; Ahmed *et al.*, 2000). Instead, it is suggested that policies aiming at increasing access and utilization should take on both a supply and demand side approach. Empirical research shows that when ill, a variety of factors influence whether the individual seeks health care or not. These factors include socio-economic status, cultural beliefs, geographical accessibility, disease pattern, etc (Shaikh and Hatcher, 2004; Ahmed *et al.*, 2000; Ahmed *et al.*, 2006).

The decision to seek care in Sierra Leone also incorporates the decision of what kind of care to utilize. The myriad of available health care options includes not only formal governmental providers but also village doctors, who often do not have any formal training, as well as traditional faith-healers (Ahmed *et al.*, 2000). This diversity of the health care sector should also be taken into account when studying the decision-making process of health service utilization.

The ANC Programs implemented in Sierra Leone needs to cost and to assess the effect of the ANC service package in terms of its content, coverage, affordability, and sustainability of services over time. The challenge to in Sierra Leone is to formulate application of the WHO FANC model within the needs and resources and identify the best approaches to deliver effective and sustainable ANC. The available literature shows that there has been less attention to the role and content of antenatal care and thus indicate to monitor progress in ANC and measured; the presence of skilled personnel during child birth, antenatal and postpartum care coverage, and deliveries at health facilities. The world health organization estimates that there are 5.1 million deaths in the new born period; that is before the baby is one month old. Almost 3.4 million of these occur during the first week of life, while 4.3 million fetal deaths are estimated to take place before or during delivery. These 7.6 million prenatal deaths are largely consequences of poorly managed pregnancies and deliveries or the result of inadequate care of neonate during the first critical hours of life.

2.7 BARRIERS TO UTILIZATION OF CHILD HEALTH CARE SERVICES IDENTIFY THE MAJOR ISSUES AND CAUSES THAT AFFECT THE FREE HEALTH CARE DELIVERY;

The challenges to implementation of minimum child health services include inequality due to inefficient allocation of available resources within the sector, poor distributions of human resources, low staff morale resulting from poor remuneration and over dependence on untrained personnel in primary health facilities. Generally, many factors contribute to less utilization and access to child care services; high rates of teenage pregnancy, low perception of pregnancy related risks, low level of female involvement in reproductive health and rights, harmful and negative culture on children, gender relations, and health seeking behavior as well as poor infrastructure.

A good deal of literature has identified a number of barriers faced in seeking professional health care, particularly for

child health services. Studies have shown that there are many missed opportunities for care, both because of client- and health system-related factors. Mothers and children may face risks because of limited or late-term ANC visits, low-quality care during visits due to poor provider training, infrastructure and administrative weakness at facilities (Armar, 2006). Education provides the consumer with the basis for evaluating whether they require treatment. While it is sometimes suggested that individuals are unable to assimilate information on treatment options, this assumption is challenged by Leonard's recent work in Tanzania (Leonard, 2002). These studies suggest that, far from being passive consumers, patients actively seek out not only the best-known provider but the best facility for a particular illness. Thus, Perceptions of quality do, in fact, accord quite well with technical evaluations.

Location and distance costs are often seen to negatively impact service utilization. A study in Vietnam found that distance is a principle determinant of how long patients delay before seeking care (Ensor, 1996). Another, in Zimbabwe, suggested that up to 50% of maternal deaths from hemorrhage could be attributed to the absence of emergency transport. At the same time, distance is also cited as a reason why women choose to deliver at home rather than at a health facility in many rural areas in central and western Uganda (Nuwaha, 2000). In relation to the above, location of health centers and facilities is another important dimension of the cost of care. A study in Burkina Faso, for example, suggested that transport costs accounted for 28% of the total costs of using hospital services (Sauerborn, 1994).

The Uganda Demographic and Health Survey (UDHS) 2007 findings indicate disparities in utilization of health services, with rich, urban and more educated people more likely to use health services than the poor less educated rural residents. This trend was attributed to better economic and physical access to services among the former but also to attitudes influenced by religion, culture and limited understanding of disease causation among the latter. The reason why the poor do not make more use of public services is driven by both supply and demand factors (Ensor, 2004). Cultural and socio-economic factors such as the low status of the female in society, limited decision making powers, social immaturity and financial limitations might contribute to poor utilization of ANC services, resulting in an increased incidence of pregnancy and obstetric complications.

Many cultural, religious, or social factors may impede the demand for health care. In communities where women are not expected to mix freely, particularly with men, utilization of health services from static facilities may be impeded. Cultural conventions about proper cultural norms, restrictions, can prevent women from seeking health care outside the home for themselves and their children. This barrier is often raised still further when men provide services, and has been offered as one reason why Asian women living in Western countries often make little use of health services. Another example of culture as a barrier to using health services is the perception and unacceptability of modern contraception among men in parts of many rural areas of Uganda including Kisoro. Shaffer in his study suggest that cultural issues relating to language and staff insensitivity are important and deter some women from accessing antenatal care early and regularly (Shaffer, 2002). These kinds of cultural oversights may

be viewed as disrespectful by women from various ethnic groups and generate feelings of frustration and further marginalization.

In general most specifications do not include interaction variables between demand-side barriers and income. As a consequence, most literature indicates the specific contribution of economic status on demand for services rather than indicating whether barrier-elasticity differ by economic status. The evidence certainly provides some support for the intuitive hypothesis that barriers are more important for the poor. Financial barriers may also interact with other demand barriers. One study in Kazakhstan, for example, found that the education of the household head or the care-seeker was an important determinant of the willingness to travel long distances to obtain treatment.

In practice, supply and demand side issues are not so easily separated. If the available health care is of poor quality, it is not surprising to find there is little demand for it. There is evidence that demand does react to quality. Poor quality of health services is a major problem in many, but not all, developing countries (World Bank Report, 2004). However, facilities open and close irregularly; absenteeism rates of doctors and nurses can be very high; staff can be hostile, even violent to patients; misdiagnosis is not uncommon, medicines are all too often unavailable, sometimes due to staff pilfering for use in private practice; and there is inappropriate prescribing and treatment. Deficiencies in quality have direct implications for access to effective health care. Further, one expects that demand will diminish in response to the poor quality of the care offered. This confirmed by the example of Ghana where a decline in quality of public health care was associated with 40% fall in utilization within only five years (1979-1983).

A second problem is that the available resources are not allocated to the most effective interventions, are geographically concentrated in large cities, and do not reach the poor. Despite the WHO Alma Ata Declaration, the bulk of public health expenditure continues to be absorbed by hospital based care delivered at some distance from poor rural populations. Shifting the balance of resources further toward primary care would not necessarily have the desired impact on the level and distribution of population health. However, there are major deficiencies in the quality of primary care delivered in many developing countries.

Other studies provide —harder evidence of change in behavior. Education and information campaigns in Nigeria, Sierra Leone, and Ghana all led to significant reported increases in attendance at normal and complicated deliveries as a result of the intervention (Nwokobya, 1997). In Malawi, health information improved women's knowledge of the need for antenatal care, complications, and post-delivery care and increased the use of services (Gennaro, 2001),

A multivariate analysis of 40 low-income countries found that government health expenditure as a percentage of total health expenditure was significantly associated with utilization of skilled birth attendants and caesarean section rates, but not antenatal care, allowing for factors such as per capita health expenditure (Kruk, 2007). This supports the view that public subsidies of various sorts are likely to be necessary to improve access and skilled attendance.

Delivery of essential services concentrates on improving the quality of staff skills, protocols of treatment, availability of supplies and environment of health facilities. Yet while these interventions are important, they do not address many of the barriers to accessing services faced by a patient in a low-income country like Sierra Leone.

III. 3.0 RESEARCH METHODOLOGY

3.1 PREAMBLE

This chapter presents an interview of methodology and procedures applied in this study. It describes the process that was employed to collect and analyze data in order to explore and measure the level of utilization of Child Health Care. This section gives information about research design, description of area of study, population of study; sample size, sample selection, methods of data collection, data analysis techniques, procedure, data collection instrument, validation, problems that the researcher encountered and limitation and constraints during the study.

3.2 RESEARCH DESIGN

The research was a cross-sectional study. A combination of qualitative and quantitative data collection methods was used. In –depth interviews were conducted to both child attendees and providers at the Ola Doring hospitals. The researcher and the interviewee agreed to sit in a private place and conduct the interview. The interview was conducted in Creole language that was convenient for the interviewees. Survey questionnaires were administered to child attendees on exit after receiving child health care services and health care providers at the Hospital. Some variables were quantified and others explored in depth, thus generating description. The general methodology adopted was a descriptive study. The qualitative method used involves the use of informal interview, observation and discussions. The use of qualitative method involves the administration of questionnaires out of which the large portions of the facts are obtained.

3.3 DESCRIPTION OF THE STUDY AREA

The study was carried out in Freetown covering one hospital- the children's referral hospital. The researcher wanted to get a clear picture of child health care utilization in the area of study. Ola Doring Children's Hospital which is housed in the compound with Princess's Children Maternity Hospital, the country's major referral maternity, in the Western Urban (Freetown) is the study area. Ola Doring Children's Hospital is located in the Fourah Bay Community and along the main Fourah Bay Road and , off the left wing of the country's major sea port, Queen Elizabeth II and the west wing of the country's biggest market, Dove Cot/Moa market in Freetown. The research area, nevertheless, is characterized by all tribes in Sierra Leone plus foreigners from other countries which are working towards development of the country.

In 1792, Freetown became one of Britain's first colonies in West Africa. It is the largest city and also capital of Sierra Leone lying on the peninsula near the Atlantic coast and hosts the third largest natural harbour in the world – Elizabeth II Quay. The landscape in Freetown is very hilly which were named Serra

Leôa ("Lion Mountains") by the Portuguese navigator Pedro de Sintra when he explored the West African coast in 1462 and I've heard it described as looking similar to other great landscapes for example the San Francisco Bay Area. In Freetown, you can see the sea from almost any point in the city and you are never far away from the beach! Today, Freetown is a buzzing capital and is lively by day or by night. On a busy day, Freetown echoes with the sound of hooting cars, local traders and passers-by. The west of Freetown is mainly residential and further west (South-West) you will find some of the country's most beautiful beaches.

There are dozens of Hospitals in Freetown and each certainly one of them is often counted on to treat typical troubles and more severe complications like surgeries and long term treatments. If you suffer from a heart condition or other dangerous conditions it's significant to know exactly where the nearest Freetown Hospital is in your area. Ola During children's hospital is on the street of "Fourah Bay Road" that is located in the north of Western Area Urban with the zip code of 00232. It is about 18.231 meters long. Ola During children's hospital is next to devastation Bay and is located in Western Area, Sierra Leone. As the name implies the hospital is specialized to treat all ailment of children in the city and serves as the centre for children's referrals.

3.4 POPULATION OF STUDY

The study population comprised of mothers and or caregivers seeking Child health care services at Ola During hospital. This hospital was selected because it is the main referral hospitals in the country. Although the study focused on mothers and or caregivers seeking Child health care services in Ola During hospital an informal interview, observation and discussions were conducted with the health care providers.

3.5 SAMPLE SIZE AND SELECTION PROCEDURES

The population of the study area is estimated for caregivers per annum **seeking Child health care services at the facility**. The study population particularly is focused on staff and **mothers and or caregivers seeking Child health care services at Ola during hospital** since August 2017 to August 2018 irrespective of the health. Twenty (20) sample respondents were selected from among the staff, fifty (50) neonate caregivers/mothers and eighty (80) under Five (5) caregivers/mothers served as a sample size. This was done using the stratified random sampling method. This was because the population from which the sample was to be drawn does not constitute a homogenous group. The technique applied was that the population was first stratified in to a number of non-overlapping sub population or strata.

The second stage involved the selection of sample items from each stratum as each stratum had more than the required sample size. This was done using the simple random sampling, where each and every member has an equal chance of being selected. The names of all members were written on slips of papers folded and placed in a plastic bag and properly shaken to conduct a lottery for each stratum. A total of one hundred and fifty (150) papers were removed at random, one after the other without replacement. All the One hundred and fifty (150) eligible

participants in the selected catchment health facilities were interviewed using equal proportionate probability sampling giving a respond rate of 100% of staff and **mothers and or caregivers seeking Child health care services** who responded to questions pertaining to child health care service utilization.

3.6 DATA COLLECTION INSTRUMENT AND VALIDATION

The collected data was accumulated, categorized and analyzed keeping in mind the objectives of the study. The analysis of quantitative data was done with the help of statistical tools like MS Excel etc., and interpretation of data were based on statistical generalization. The data were first summarized to obtain raw scores some of which were converted in to percentages, while others were presented in the form of tables and charts. The qualitative method was used to explain the significant phenomenon, causalities, social realities, and experiences.

In this study, data were collected by questionnaire survey. Interview method was also followed. The combination of these two methods (Quantitative and Qualitative) therefore, helped to collect reliable and valid data.

The findings of the study from one type of method were used to check against the findings derived from the other type. Furthermore, it is mentionable that the researcher visited the field and administered the questionnaires with the respondents personally. Interviews and discussions were conducted by the researcher as well. In case of content analysis, principle of authenticity and objectivity has been maintained. So data are credible and reliable as much as possible.

3.7 LIMITATIONS AND CONSTRAINTS OF THE STUDY

Participants were asked for their consent to participate in structured questionnaire. But most importantly, the values and norms of the local people were studied well and respected to avoid any misconception and all the necessary permission from the university and the hospital authorities where the research was carried out.

All research conducted are prone to limitations and constraints. Collecting primary data from an area in Sierra Leone is not an easy task. Other factors are likely to limit the research are scope of the study, time and resources, access to **Child Health Caregivers**; and inadequate funding.

3.7.1 Scope of the Study

The major limitation of this study was its scope. The researcher only investigated the utilization of child health care with specific reference to the Ola During Children Hospital in Freetown. Other areas were excluded, due to funding and adequate human resource.

3.7.2 Inadequate Time and Resources

Time and resource constraints always pain the researcher. Limited time and resources have been allotted for the completion of this study.

3.7.3 Access to Child Health Caregivers/Respondents

Access to respondents has always been difficult in Sierra Leone. Collecting data from a particular segment of the

population of which vast majority is illiterate proved to be very difficult for the researcher. Many denied giving in to any interviews and those who were not reluctant were found shaky in their responses. It was not easy to get them persuaded to respond to my questions.

3.7.4 Inadequate Funding

For a work like this to be done completely and successfully without many problems, there must be enough available resources to cover certain cost such as: internet browsing, transportation, printing etc. These were not very easy to go through. In fact, this was one of the major causes to the delay of the work to a large extend.

The foregoing is a description of the methodology of the study. That is, how sample were selected and how data were collected and analyzed. The next chapter is concerned with data presentation, analysis and interpretation of result findings.

3.8 ETHICAL CONSIDERATION/ISSUES

Ahead of the commencement of this investigation, a research proposal and protocol was designed and submitted to the research supervisor who is attached to the Department of Environmental Health Sciences for approval. The permission to carry out the study was granted by the Medical Superintendent at Ola During Government Hospital. To ensure accuracy, the self-administered questionnaire was edited by my supervisor and pretested before used. This is to ensure consistency. Study subjects were requested to fill an informed consent form before they were recruitment into the study. Study subjects were given the options to withdraw from the study at any time if they so desire and that they were not being coerced for taking part in the study.

IV. 4.0 DATA PRESENTATION, ANALYSES AND DISCUSSIONS

4.1 INTRODUCTION

This chapter presents the study finding as obtained from the field by the researcher. The study was guided by five research objectives; to determine the utilization of Child Health Care service at the Ola During Children Hospital in Freetown.

The study covered a population of 150 respondents. To obtain data from the field a total of Twenty (20) sample respondents were selected from among the staff, fifty (50) neonate Caregivers and eighty (80) under Five (5) Caregivers, these serve as a sample size. The questionnaire was administered to respondents to assess the utilization of Child Health Care service at the Ola During Children Hospital in Freetown. The ANC and service provided; the practices accessibility and affordability, the demographic and factors influencing utilization were examined for easy analysis and interpretation of data collected from the field, the data was captured in the different responses and categorized into different themes.

For easy analysis and interpretation of data collected from the field, the researcher captured the different responses and categorized them into different themes and tabulations were calculated as demonstrated in the following sections of this chapter.

4.1 RESPONDENTS PERSONAL AND SOCIAL DEMOGRAPHIC CHARACTERISTICS

This section focuses on both Care givers and staff as the study set out to establish in terms of educational status, marital status, age, occupation and economic status.

Table 1: Respondents personal and social demographic characteristics

Category	Staff (n=20)	%	Under Five Care givers (n=80)	%	Neo natal Care givers (n=50)	%	Total (n-150)	%
Educational status								
No Formal Education	0	0	13	34.2	25	65.8	38	25.3
Primary School	0	0	22	55.0	18	45.0	40	26.7
Secondary Education	0	0	42	95.5	2	4.5	44	29.3
Tertiary Education	20	71.4	3	10.7	5	17.9	28	18.7
Marital status								
Single	6	11.8	15	29.4	30	58.8	51	34.0
Marriage	8	12.7	43	68.3	12	19.0	63	42.0
Devoiced	5	16.1	18	58.1	8	25.8	31	20.7
Widow	1	20.0	4	80.0	0	0.0	5	3.3
Age								

12-18 years	6	24.0	12	48.0	7	28.0	25	16.7
19-35 year	9	13.0	32	46.4	28	40.6	69	46.0
36-45 year	3	7.0	28	65.1	12	27.9	43	28.7
46+	2	15.4	8	61.5	3	23.1	13	8.7
Occupation								
Trader	0	0.0	34	50.7	33	49.3	67	44.7
Housewife	0	0.0	16	66.7	8	33.3	24	16.0
Student	0	0.0	25	80.6	6	19.4	31	20.7
Office Worker	20	71.4	5	17.9	3	10.7	28	18.7
Monthly income								
Below SLL 50,000	0	0.0	58	87.9	8	12.1	66	44.0
Between SLL 50,000 and SLL 100,000	0	0.0	8	22.2	28	77.8	36	24.0
Above SLL 100,000 but Below SLL 500,000	2	8.7	9	39.1	12	52.2	23	15.3
Above SLL 500,000	18	72.0	5	20.0	2	8.0	25	16.7

Source: Author's Research data, 2018

Table 1 above demonstrates the respondents personal and demographic characteristics of the staff, parents of neonate and under Five (5) respondents. In terms of Educational status, the all the staff had attained Tertiary Education but there was a shift in the parents/care takers who took the children for child health care service as 95.5 % of those who attained secondary education were parents/care takers of under five (5) and the least of 4.5 who attained secondary education for parents/care takers who brought in neonatal. The study findings revealed that, the low levels of education had significantly influenced the timing and utilization of child health care facilities.

The findings in Table 1 further portrays that, majority of the respondents (42%) were married, although the widows were 3.3% they were in the majority among the parents /caretakers of under five (5) that were brought to the Hospital. The study revealed that marital status plays a significant role in determining women's utilization of child health care service. It was discovered that most married women go for child health care service early than single, widowed and divorced mothers.

The field results show that majority of the respondents were in the age bracket of 19 – 35 years (46%). Comparison of age groups (15-29 and 30-49) in all three category; showed that there is no significant difference for the age bracket of 19 – 35 years indicating the highest for all the age groups.

The field results show that majority of the women 44.7 % were traders (mainly practicing petty trading) and their level of income was low. Level of income at a household was defined on the basis of one member having permanent job, engaged in small scale business and subsistence farming. Households with a reasonable source of income were categorized as having fairly high income. Low –income level households were those that depended on petty trading for their living. The overall level of income of the participants was low below SLL 50,000 (44%). This means that there are high poverty levels among respondents in the area of study which in one way or the other affects their ability to access and utilize child health care facilities that are in most cases located kilometers away from their area of residence.

A critical analysis of the field results in Table 1 indicates that, most of the mothers were young, and had not attended school. All these contribute to limited ability to utilize child health care services and therefore poor care seeking behavior. Education of the mother and that of members of the household were found to be significantly associated with the levels of utilization of child health care services.

The reasons some respondents gave for underutilization were: child had a mild fever only and therefore no need to visit the clinic; a long distance to travel from home to the clinic,

avoiding making many trips to the health facilities for minor illness, and thinking they were able to treat the child with minor pills from drug stores or native herbs.

Twenty care providers were contacted during this study. These included the medical officer, senior nursing officers, nurses and midwives from the hospitals.

4.2 CHARACTERISTICS OF ANC PROVIDERS

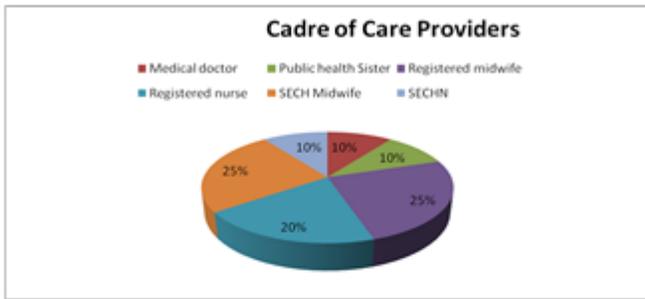


Figure 1: Care Providers of Respondents by Cadre. Source: Author's Research Data, 2018

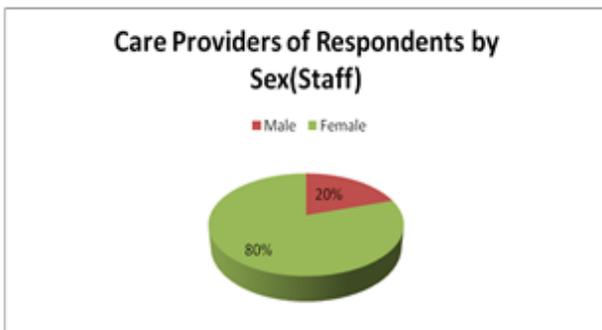


Figure 2: Care Providers of Respondents by Sex. Source: Author's Research Data, 2018

According to the study findings, majority of the care providers were females (80%) in the age group of 19-35years. The health care providers had a positive perception towards child health care and were helping parents/caretakers obtain the necessary services. However, the providers identified challenges of shortage of personnel and equipments necessary for the services.

Total	20
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Source: Author's Research Data, 2018

4.3 FACTORS INFLUENCING UTILIZATION OF CHILD HEALTH CARE

Table 2: Care Providers of Respondents by Sex and Cadre.

Variable	Male	Female	Total
Sex	4	16	20
Cadre			
Medical doctor	2		
Public health Sister	2		
Registered midwife	5		
Registered nurse	4		
SECH Midwife	5		
SECHN	2		

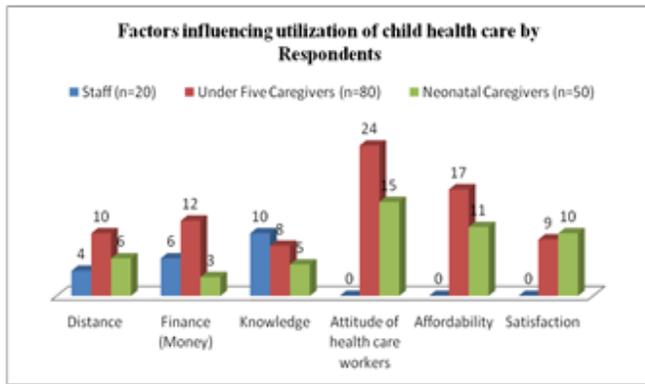


Figure 3: Factors influencing utilization of child health care by Respondents. Source: Author’s Research Data, 2018

One of the objectives of the study was to determine the factors influencing child health care services in “Ola During” Children Hospital. Through exit interviews with child health care attendees, participants from each group (Under five and Neonatal) were asked to mention some factors influencing utilization of child health care. Responses from each group were summarized thus: majority of the respondents 13% travel 8 – 11 miles from home and most of them are attended to by other health practitioners and not medical doctors. Therefore many 55% prefer to be attending private facilities or rather come to the hospital only when the conditions are really serious. Majority of the participants said they don’t attend the child health care because of lack of money for transport or to pay for services although there is a policy on free health care for all pregnant women, lactating mothers and children under the age of five. Most of the participants do not think it is necessary to bring their child for health service especially when the condition is not serious and so they chose to attend at their own time or when the condition is serious. The attitude of health care workers, the affordability, the satisfaction, and the distance are all factors contributing to the underutilization of the child health care. Most participants only visit when they are forced by relatives or when the condition goes worse.

4.3.1 Poor Quality of Care

Poor quality care at the health facility was mentioned by the respondents. The type and quality of child health care services that the women reported receiving were inconsistent and inadequate, and differed greatly from health workers. In this regard one woman mentioned that, the reputation of nurses and midwives regarding care for children was not good and as a result many women were scared of their bad behavior. A second woman echoed —nurses are particularly strict on attendees who bring in their sick child and most women prefer to postpone their visits to health facilities for child health care services and even sometimes buy drugs over the counter or use herbs.”

Another significant finding from the study in relation to poor quality care was mistreatment by health care providers. One respondent stressed that sometimes parent bring their sick child in hospitals and the nurses are not bothered and don’t treat them because they did not give them money.

4.3.2 Accessibility to the hospital

With respect to delivery care, nearly most of the respondents were not satisfied with the care they received at the hospital, because they reported health providers were rude and not treated well or were not treated in a timely manner. Mothers who were satisfied reported that the facility had saved their baby’s life or because staff identified the problem they were experiencing. In addition, nearly all of the women believed that the causes of infant mortality at health facilities were providers ‘mistakes or hospital procedures while health provider thought it was the late arrival.

The above findings contravene the fact that; every child has the right to access high quality child health services that in turn must be accessible, affordable, effective, appropriate and acceptable to them in order to avoid preventable morbidity and mortality. Many complications of childhood illness that lead to mortality can be prevented by providing quality care that involves early detection of problems and appropriate timely interventions.

4.3.3 Myths and misconceptions

The knowledge, perceptions and attitudes of child attendees were assessed. The study established that participants had myths and misconceptions about seeking Child health early and in health units. The main reasons cited for failure to attend early were based on the woman’s own beliefs and attitude that the facilities would provide quality care, or on the advice given by family members. All of the attendees pointed out that the government facility health care providers are not polite in handling patients. They do not explain when doing procedures; misplace records and reject most referrals.

However, the negative experiences of women regarding the care they received and the belief among many participants that late attendance was caused by providers requires a thorough investigation into the quality of child health care services.

4.3.4 Traditional Beliefs and Practices

The study demonstrates that many participants are still engulfed in the traditional past. The respondents’ views revealed that many attendees seek ANC services late. The attendees reported that community norms were significant constraints in planning for early Child health care service. A nursing aid also described that attendees in general are reluctant to go for health services unless they suspect a problem with their child is serious. She elaborated that —the influence of culture is deeply rooted in the society, which makes utilization of health services generally low among caregivers. Others even have the false belief that medical officials harass them. The researcher established that the status of women in the area of study was still low and they cannot make independent decisions about their child’s health even when they have money.

4.3.5 Financial Difficulties

As established by the study, the level of income of the respondents based on their economic activities was so low. As a result their utilization of child health care services was reported to be minimal. It was established that, perceived expense of the child health hinder early attendance, the respondents stressed that transport costs, physical inability to travel long distances

make many attendee utilize the available alternatives and visit health units late.

In this study, majority of attendees complained of poverty and sometimes their finances being in the hands of their husbands while the widowed lacked control of property left to them. This reflects the real situation in the area of study.

4.3.6. Alternatives to Child health care service

The health care providers indicated that some mothers undertake other alternatives in early phases of childhood illness. As a result substantial proportions of women bring in their children when the conditions are very serious. It is clear that child mortality from within and without the health care system is not well addressed. The low child health care rate found in this survey is inconsistent even though many strategies have been laid by the government like the free health care initiative. There is also need to focus on women with no formal education and particularly those who have already had lost a newborn or young infant. To encourage earlier child health care attendance, service delivery must be improved and messages that aim at removing barriers to child health care utilization should be increased.

4.3.6. Ignorance

The study established that, the majority of the respondents had less education levels which was also a reflection of the entire study population. In this regard some health care providers revealed that most of the women access the hospital late because of ignorance. Many mothers do not want to make many visits to the hospital/clinics. Because of the high illiteracy levels among women interviewed in the survey and generally among attendees, there is need for outreach efforts by employing community engagement strategies, and counseling and educational materials used needs to be audiovisual, interactive and pictorial. This will enable the health providers to reach the uneducated women. Due to the fact that many women are illiterate, they also have limited information on the dangers related to late entry to the hospital. The main purposes of early arrival of child care are to prevent certain complications, such as anemia.

4.4 KNOWLEDGE OF MOTHERS ABOUT BENEFITS OF SEEKING CHILD HEALTH CARE EARLY

Data collected show high level of knowledge among child health care attendees. Through the study, the researcher established attendees' knowledge levels by asking women to mention likely consequences of attending ANC late. Majority, 88.5% of the responses indicated that the respondents had knowledge about dangers a child might come across when attended hospital late during childhood illness.

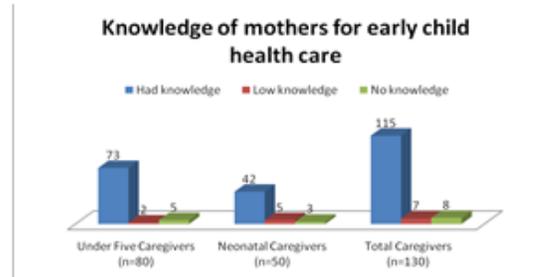


Figure 4: Knowledge of mothers for early child health care.

Source: Author's Research Data, 2018

4.5 DISTANCES TO HEALTH FACILITIES.

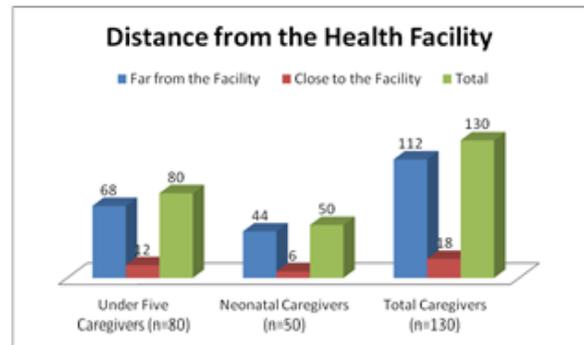


Figure 5: Distance from the Health Facility. Source: Author's Research Data, 2018

Seeking and utilization of child health care services by women and mothers is determined by a number of factors of which distance and mode of transport is one of them. To establish what influences women to seek alternatives and attend late, the researcher took the task of knowing how far the ANC attendees had traveled to the clinic/hospitals. The study findings on the availability and distances of child health care service revealed that women cover long distances to the health facility where child health care services are provided. This was expressed by respondents during questionnaire interviews, in depth interviews and focus group discussions.

4.6 DISCUSSIONS

4.6.1 Factors Influence the Free Health Care Initiative

The findings on the Sierra Leone Free Health Care Initiative, clearly state the need in Sierra Leone. However, its ambition was also a risk, and weaknesses in implementation have been evident in a number of core areas, such as drugs supply. It was noted that Sierra Leone Free Health Care Initiative was one important factor contributing to improvements in coverage and equity of coverage of essential services for mothers and children. The findings suggest that even-or perhaps especially-in a weak health system, a reform-like fee removal, if tackled in a systematic way, can bring about important health system gains that benefit vulnerable groups in particular. The findings highlight how a flagship policy, combined with high profile

support and financial and technical resources, can galvanize systemic changes. In this regard, the story of Sierra Leone differs from many countries introducing fee exemptions, where fee exemption has been a stand-alone program, unconnected to wider health system reforms. The challenge will be sustaining the momentum and the attention to delivering results as the Sierra Leone Free Health Care Initiative ceases to be an initiative and becomes just 'business as normal'. The health system in Sierra Leone was fragile and conflict-affected prior to the Free Health Care Initiative and still faces significant challenges, both in human resources for health and more widely, as vividly evidenced by the current Ebola crisis.

4.6.2 The Impact of Health Service in Preventing Child Death

Child health is a growing concern at the global level, as infectious diseases and preventable conditions claim hundreds of lives of children under the age of five in low-income countries like Sierra Leone. Approximately 7.6 million children under five years of age died in 2011, calculating to about 19 000 children each day and almost 800 every hour. About 80 percent of the world's under-five deaths in 2011 occurred in only 25 countries. This study reviews essential recommendations and interventions for improving child health, which if implemented properly and according to guidelines have been found to improve child health outcomes, as well as reduce morbidity and mortality rates. It also includes caregivers and delivery strategies for each intervention. Interventions that have been associated with a decrease in mortality and disease rates include exclusive breastfeeding, complementary feeding strategies, routine immunizations and vaccinations for children, preventative zinc supplementation in children, and vitamin A supplementation in vitamin A deficient populations.

4.6.3 Alternatives to Child Health Care in Freetown

The research findings show that; majority of the respondent who attends the Ola During Children's hospital had other alternatives to child health care. These included use of local herbs, over the counter drugs and traditional healers. This implies that, cultural beliefs are still a determining factor to the decision in seeking child health care services.

The study established ill treatment of child care takers from health care providers. Some health care providers are rude and sometimes abuse child care takers at that critical time when a mother brings in the child in a very sick condition. This demonstrated less ethical values among health providers. In addition research findings obtained, there was an observation some child care takers seek alternatives care because the husbands were refusing to accompany or even block them from attending.

4.6.4 Late Child Health Care Attendance

The study findings also illustrate that almost all of the respondents accessed child health care late in very critical condition. There is evidence to suggest that care takers seek child health care late because of poverty. The study findings show that many of the respondents' income is low, so mothers fail to raise money for transport, lunch during child health care visit and lack what to put on like dresses. Thus some mothers seek child health

care late because the husbands cannot raise money for their child Hospitalization.

Ola During Children's Hospital is located in the Fourah Bay Community and along the main Fourah Bay Road off the left wing of the country's major sea port, Queen Elizabeth II and the west wing of the country's biggest market, Moa market in the Western Urban Freetown.

The data obtained from the study show that distances from the hospitals contribute to care takers to seeking child health care late. From data analyzed the biggest percentage of ANC attendees traveled longer distances to the hospital. Moreover Freetown is very congesting, with very high traffic stuff especially during the day making the major roads to the hospital impassable. This suggests lack of adequate means of transport in some parts of the area of study was a hindrance to accessing child health care services.

The findings indicated that care givers in the area of study are engaged in both in- home and tedious out-door trading activities for which they allocate little time for seeking medical care in general. Related to this; a study in Ethiopia, established that heavy workload, lack of access to health services, poverty, traditional practices, poor social status and decision-making power, and lack of access to education are among the highly prevalent socio-cultural factors that potentially affect the health of women (Marina and Mugoni:2005).

The findings also suggest that other factors, aside from service availability, may drive service utilization differentials between and among rural women. These factors include disparities in economic and cognitive access, perceived quality of child health care services, and differences in individual knowledge and attitudes towards child health care services. A comprehensive conceptual framework of how different dimensions of access to and quality of health services affect service utilization in Freetown. Such a framework should also take into account the emergence of non-public sectors that are increasingly involved in the provision of health services. A more comprehensive understanding of the service environment, consisting of all sectors and how different dimensions of service provision may affect utilization, will guide efforts to improve service utilization.

The study established that, late attendance was attributed to child health care takers seeking alternatives to child health care. This is a clear marker of how health and social systems threaten the capacity of child health care takers to seek medical attention promptly. While not attending child health care services as presented by the respondents, its true causes are grounded in child health care taker's acute socio-economic vulnerability which denies them access to timely and appropriate care. The severe shortage of qualified health workers, unavailability of transport to facilitate emergency referrals, searing poverty that denies people to afford health care; lack of education regarding basic reproductive health and the complications of childhood illness. More tragically, however, lack of adequate child health care services has contributed to the continuing and unabated acceptance that children naturally die during childhood illness, or are left with devastating disabilities.

Age was identified as a factor in child health care service late attendance, slightly more than half of the child health care takers in the study whose age was reported were 19- 35 year. It

also highlights the need for girls and young women to possess the fundamental rights to determine freely when they will marry and when they will begin having children. While it remains vital to recognize the severe impact of child health care service late attendance on young girls, the findings expand on the widely held assumption that ignorance on seeking proper and adequate child health care service predominantly affects very young women.

The findings of the study highlighted that those child health care takers who are slightly educated have maximally availed child health care service when compared to less educated and illiterate ones. Significant differences have been observed according to women's education in consulting a health professional. Attainment of education has a major influence on utilization of child health care service.

4.6.5 Respondents Recommendations on How to Improve Child Health Care Service Utilization

The study identified that it was significant to provide women with education and counseling on child health care. This means that Women in general should be encouraged strongly to take the sick child as early as possible to the hospital so they can receive emergency care promptly when needed.

Public education and programs to prevent child health care takers from seeking dangerous child health care service alternatives must therefore, target all women of reproductive age. In particular, maternal health services should provide accurate and timely counseling to women as well as key decision makers, such as husbands, mothers-in-law and parents on the importance of utilizing child health care service in early days of sign and symptoms, and encourage women and their families.

Training for health workers on clinical skills, as well as on client-provider interaction, was suggested as critical to ensure high quality, professional child health care service. Supplies and equipment must be available to health workers, and supportive supervision instituted to monitor service delivery standards. Health workers, in turn, need to be supported through training and supervision to provide essential, adequate, services to child health care attendees.

The Government should pursue its efforts to improve the availability of child health care service at existing and/or new health facilities, particularly those that are offering child health care service. Any interventions that aim to increase child health care service utilization should include efforts to target children of lower health status and educational achievements, as well as areas where women in general do not have high educational achievements.

Broad-based educational and advocacy programs are needed to dispel negative myths about seeking child health care service at Ola During hospitals as well as to encourage social support for child care takers. Consistent and reliable information on where and when services are available also needs to be disseminated to assist child health care takers to access treatment quickly. Radio programs and outreach through faith-based institutions may represent effective communication channels to reach them.

From the findings, it is clear that child health care service programs must address the reduction of infant and 'under five' mortality from within and without the health care system. The

low child health care rate found in the survey is an indication that, there is need for community outreaches about the importance of child health care service to those most at risk for not being aware of or able to access appropriate care. In Freetown efforts need to be intensified and there is need to focus on care takers with no formal education and particularly those who have already had lost a newborn or young infant. Although the perceived expense of the child health care service may hinder attendance, it is uncertain that free health care initiative has increase coverage and a perceived negative attitude of health workers and poor quality of care would remain barriers.

V. 5.0 RESEARCH CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents the conclusions and recommendations to the research findings in relation to the research objectives. The results were discussed in line with the research findings as presented in Chapter Four.

5.2 CONCLUSIONS

From the findings, it is clear that child health care service programs must address the reduction of infant and 'under five' mortality from within and without the health care system. The low child health care rate found in the survey is an indication that, there is need for community outreaches about the importance of child health care service to those most at risk for not being aware of or able to access appropriate care. In Freetown efforts need to be intensified and there is need to focus on care takers with no formal education and particularly those who have already had lost a newborn or young infant. Although the perceived expense of the child health care service may hinder attendance, it is uncertain that free health care initiative has increase coverage and a perceived negative attitude of health workers and poor quality of care would remain barriers.

The health and survival of Children in Freetown has gone unnoticed far too long. However, both immediate and long term opportunities exist to improve the situation at all levels. Sierra Leone has many policies in place but the utilization of child health care service illustrates a critical policy gap, especially in regard to the free health care initiative.

Existing policies and guidelines have not been fully disseminated, integrated or implemented by service providers, leading to poor and inconsistent utilization of child health care service especially in rural areas. There is an opportunity for policy makers to take a leading role to improve utilization of child health care service from the highest level in both public and private facilities. This can be achieved through making and disseminating appropriate policies, improving staffing and supervision in facilities and creating an enabling environment for community level care.

The study revealed that attitude of health care workers, the affordability, the satisfaction, and the distance are all factors contributing to the underutilization of the child health care. Another significant finding from the study in relation to poor quality care was mistreatment by health care providers.

The study established that participants had myths and misconceptions about seeking Child health early and in health

units. The study demonstrates that many participants are still engulfed in the traditional past.

The study revealed that late access to the hospital is because of ignorance and the high level of illiteracy among women interviewed in this study.

The researcher established that the status of women in the area of study was still low and they cannot make independent decisions about their child's health even when they have money.

It was established that, perceived expense of the child health hinder early attendance, the respondents stressed that transport costs, physical inability to travel long distances make many attendee utilize the available alternatives and visit health units late.

The study findings on the availability and distances of child health care service revealed that women cover long distances to the health facility where child health care services are provided.

The findings highlight how a flagship policy, combined with high profile support and financial and technical resources, can galvanize systemic changes. In this regard, the story of Sierra Leone differs from many countries introducing fee exemptions, where fee exemption has been a stand-alone program, unconnected to wider health system reforms.

The findings also suggest that other factors, aside from service availability, may drive service utilization differentials between and among rural women. These factors include disparities in economic and cognitive access, perceived quality of child health care services, and differences in individual knowledge and attitudes towards child health care services.

5.3 RECOMMENDATIONS

The study findings unveiled a number of gaps in the provision of child health care service; gaps in information dissemination systems and organizational barriers relating to accessibility and underutilization of child health care service. Thus in order to change the habit of those seeking alternatives, underutilization and attending child health care service late, the study recommended;

5.3.1. Health workers should be encouraged to take opportunity of the numbers of care takers that attend underutilization and educate them on the unpredictability of complications of childhood illness.

5.3.2. Having realized the weaknesses in the health service, there is a need to train health care workers in the concept of child health care service, with specific emphasis on ethics.

5.3.3. To improve access and utilization of child health care service, there is need to establish or strengthen national policies and locally adapted guidelines for evidence-based at the national level detailing the essential minimum components of child health care service, in line with the country epidemiological profile and country priorities and based on WHO guidelines and recommendations.

5.3.4. Considering the study findings, it is suggested that strategies should be developed for empowering communities to overcome obstacles to reach child health care service. These may include using community channels to identify childhood illness, targeting those more likely to be critical, and making the services more responsive to the needs of children.

5.3.5. Quality and performance improvement to mitigate factors affecting performance of child health care providers were

identified as a way of ensuring quality of child health care service. This interdisciplinary approach should include key stakeholders, like the health management teams, to identify service gaps. Based on the gaps identified, priority interventions should be implemented focusing on a range of performance factors such as supervision, knowledge and skills; development, and availability of key resources, supplies and equipment to ensure sustainability and long-term results.

5.3.7. The study established that many of the medical personnel handle their clients in an inhuman manner a sign of poor client handling. Training for health workers on clinical skills, as well as on client-provider interaction, is critical to ensure high quality, professional child health care service.

5.3.8. The study recommends an improvement in health care systems at all levels and improving child survival and well-being, through improving physical infrastructure, essential drugs supplies, equipment to improve the extremely difficult working conditions for staff and enable providers to offer quality care.

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Modernization of Regular Vendu Reviewed from Sociological Philosophy and Juridistic

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Abstract- The legal basic for sales auctions in Indonesia today is the Vendu Reglement Staatsblad (Law of Auction) in 1908 number 189 which is the highest source of auction law in Indonesia and is valid until now as the only "law" governing the procedures for conducting auctions in Indonesia. Vendu Reglement consists of 49 (forty nine) Articles, most of which are not valid or cannot be implemented anymore, because they cannot accomodate legal developments and the increasing role of the auction, with details : 9 Articles have been revoked, 19 Articles have been inactive, and 21 Articles are still active with various adjustments. Reglement Vendu was made by the Dutch East Indies government for the purposes of trading and selling Dutch East Indies offical assets at the time where it is surely not based on Pancasila, the 1945 Constitution of the Republic if Indonesia, and a national legal system serving the national interest. Considering the condition of the Reglement Vendu, it strongly supports the urgency to immediately prepare Auction Legal Updates in Indonesia by drafting a new auction law. The study aims to analyze and find scientific studies related to the auction both literature review, regulatory studies, and results of data collection as the basic material for formulating regulations, providing direction, and setting the scope for the preparation of Auction Legal Updates In providing input for making Academic Scripts in order to prepare the Auction Bill as mandated by law Number 12 of 2011 concerning Establishment of Legislation. The research method is normative juridical research, or the scope of dogmatic law holding the "sui generis" character. While the benefits of this research can be used as input to support the concept of academic texts, the Auction Bill which will be discussed jointly between the Government and the House of Representatives in preparing the National Legislation Program;

Index Terms- Modernization, Vendu Reglement : Philosophy, Sociology, Juridical

I. INTRODUCTION

A philosophical problem is that the current auction of sales in Indonesia is based on Vendu Reglement, Ordonantie 28 February 1908 Staatsblad 1908-189 as amended several times, most recently by Staatsblad 1941: 3. Vendu Reglement, which was born before the Volksraad (People's Representative Council in the Dutch East Indies era), has made this regulation the highest legal tender source in force in Indonesia. This regulation applies to date as the only "law" governing the procedures for conducting auctions in Indonesia. Vendu Reglement was made by the Dutch

East Indies government for the purpose of trading and selling assets of Dutch East Indies officials at that time certainly did not come from the Pancasila, the 1945 Constitution of the Republic of Indonesia, and the national legal system that served the national interests.

Juridical problem, vendu reglement consists of 49 (forty nine) articles, in which most of these articles are no longer valid or even cannot be implemented anymore, because they cannot accommodate legal developments and the increasing and outdated auction role (out of date).

Sociological problems, along with the times, the pattern of community transactions underwent a fundamental change. Conducting auctions with a conventional pattern, namely meeting buyers, sellers and auction operators in a physical forum is no longer sufficient. Information technology-based auction sales mechanism following the issuance of Auction Deed that uses digital mechanism is still not accommodated in the regulation regulation. One manifestation of its underdevelopment is the absence of internet-based auction arrangements even though the electronic auction process is currently developing. The auction process without having to be busy attended by prospective buyers is commonly applied. Moreover, there is no regulation regarding Digital Auction Deed, including auction signatures in the process of purchasing auctioned goods (digital signatures).

The term auction is currently used in 2 (two) terms. First the auction as "sale", the second auction as "purchase". Auction Auction is an auction used by a Seller to designate a buyer who is willing to pay the highest price. Auction is one way to make buying and selling transactions. Buying and selling that is carried out by the seller and the buyer. According to Rochmat Soemitro, the auction function can be seen from the use of the auction for various purposes, namely: first, the auction becomes an instrument in the completion of law enforcement as mandated in various laws, Second, the auction can free the parties from alleged KKN and unfair competition in the mechanism of determining the winner in a business process. In its development, business entities, both government and private, carry out many corporate actions that are prone to being caught in the law. The auction mechanism will reduce the legal trap because it offers competitive procedures that are accountable and open to the public. A credible auction system can also be used to support government efforts to prevent and eradicate money laundering.

Third, the auction can realize transactions that are easy, effective, transparent, and accountable. Easy because there are procedures that are always updated so that Sellers and Buyers can make requests for auction sales and submit bids according to

standards that have been standardized in an integrated marketplace. Effective because in one day the auction can be done many transactions according to the market's ability to agree on prices. Transparent because efforts are made to gather interested people through auction announcements or other credible methods so that many interested people can be gathered to compete in healthy competition. It can be accounted for because the auction mechanism is protected by law, led by an authorized public official, obtains an auction deed or legal tender. From a legal perspective, auction buyers are always regarded as good faith buyers.

Formulation of the problem :

Does Vendu Reglement in Indonesia need to be Modernized?

II. DISCUSSION

Philosophical Basic

To ensure the fulfillment of the objectives of the state as mandated by the constitution in question, sustainable legal development is carried out in order to achieve "discipline" as one of the classic functions of the law in guarding development. Change which is the essence of development and order or order which is one of the important functions of law is the twin goal of the developing society..

Because the essence of development is change, the law must play a role in it, the law cannot be understood as a static element that is always behind the change itself - the law must be ahead guarding the change. The law is not only as a follower (the follower), but must be the main driver of development.

To understand the relations and interactions between law and development, it is necessary to emphasize two things: first, legal issues as tools of change (development) and; second, the development or development of the law itself. With regard to the first thing the law as a means of community renewal. The formation of legislation is the most rational and fast way compared to other legal development methods such as jurisprudence and customary law. In this case the laws and regulations as a concrete form and the main means in carrying out community renewal.

The auction function can be seen from the use of auctions for various purposes, namely: first, the auction becomes an instrument in completing law enforcement as mandated in various laws. There are dozens of regulations at the level of law that mandate the sale of goods through auctions as one of the last efforts to resolve legal issues, this shows the important role of auctions in the national legal system. Second, the auction can free the parties from alleged fraud in the mechanism of appointing a winner in a business process. In its development, business entities, both government and private, carry out many corporate actions that are prone to being caught in the law. The auction mechanism will reduce the legal trap because it offers competition procedures that are open to the public. A credible auction system can also be used to support government efforts to prevent and eradicate money laundering, including in tender tenders that involve large amounts of money.

Third, the auction can realize transactions that are easy, effective, transparent, and accountable. Easy because there are procedures that are always updated so that Sellers and Buyers can

make requests for auction sales and submit bids according to standards that have been standardized in an integrated marketplace. Effective because in one day the auction can be done many transactions according to the market's ability to agree on prices. Transparent because efforts are made to gather interested people through auction announcements or other credible methods so that many interested people can be gathered to compete in healthy competition.

Fourth, auctions can encourage the growth of the national economy. This becomes very important when economic growth is still supported by public consumption and government spending. Auctions can be used to facilitate the movement of goods and services in the community, including in massive infrastructure development projects.

Fifth, the auction can create new markets in the sale and purchase transactions of goods and services. So far, the auction is identical to the sale of confiscated goods whose market share is limited. The Tender Act will create a guarantee of business feasibility and legal certainty which will be a driving force for the growth of private auction businesses and other supporting businesses, for example Appraiser, estimator, warehousing, consulting, auction house, insurance, credit and so on.

Sixth, the auction can be used as a medium to obtain balanced information needed by the Seller and Buyer. With this balanced information, the transaction process can run well so that fair prices will form.

Seventh, the auction has a budgetary function which is to contribute to the Non-Tax State Revenues in the form of Auction Fees, proceeds from the sale of state assets, confiscated goods to the state, gratification goods, found items, traffic raid vehicles and secure tax revenue in the form of income tax on income from income transfer of land and / or building rights, and BPHTB. That the auction system adopted in the Vendu Reglement is centralized because it relies on the State Auction Office and the Auction Officer. Along with the development of society and technology as well as the vision of reinventing governance, it is appropriate for the Auction Institution to be developed by giving a large portion to the private sector as well as an easy business process by utilizing technology including in making digital Auction Deed.

Sociological Foundation

In addition to providing legal certainty and justice in conducting auctions, the Law on Auction is intended to provide livelihoods to as many citizens as possible because the spirit is privatization by giving a sufficient portion to the private sector. The presence of the state is only in certain sectors to ensure the continuity of auctions and law enforcement. In addition, this law is expected to provide inspiration for the development of the business sector supporting auctions, for example assessment / valuation, warehousing, freight forwarding services, insurance, e-marketplace, start-up, credit and so on.

On the other hand, to meet the demands of the community it is no longer sufficient for the old law which is patterned on conventional auction services, because the development of information and communication technology has affected the lives of the people, including in buying and selling goods, including the need to implement a digital auction deed therein.

Under these conditions it is necessary to make adjustments from conventional auctions to modern auctions into statutory provisions. The drafting of the Law on Auctions is very urgent to accommodate changes in the culture of the people who are more advanced and to support the development of auction transactions through information and communication technology so that they can compete with e-commerce.

However, *Vendu Reglement* does not regulate, even does not include, when the Seller only wishes to transfer the benefit / enjoy rights without giving up ownership of the assets, or only desires to share assets. Therefore in the Bidding Law it is necessary to expand the scope and definition of the auction. The Law on Auction also regulates the use of technology which is the backbone of sharing economy.

III. JURIDICAL BASIC

Vendu Reglement and *Vendu Instructie* formed since 1908, are now considered obsolete both in terms of philosophical and technical rules, because they cannot accommodate the development of applicable law. *Vendu Reglement* consists of 49 Articles with details: 9 Articles have been revoked, 19 Articles have been inactive and 21 articles are still active with various adjustments. On the one hand there are other regulations governing auction sales but they are not in line with auction regulations, leading to violations of the law and existing sanctions which are not effective to apply.

That the Law on auctions which is an umbrella for all types of auctions does not yet exist, so this is a real effort to fill the legal vacuum while strengthening the function of the auction.

Furthermore, from an economic juridical aspect, auctions play a role in:

1. Act as an instrument in the completion of law enforcement as mandated in various laws;
2. Mobilizing public funds in the form of returning receivables from the auction results.
3. Supporting asset / property trading.
4. As a medium for the parties to avoid allegations of fraud in the mechanism of appointing a winner in a business process. A credible auction system can also be used to support the government's efforts to prevent and eradicate money laundering.
5. realize transactions that are easy, effective, transparent, and accountable.
6. encourage the growth of the national economy. This becomes very important when economic growth is still supported by public consumption and government spending. Auctions can be used to facilitate the movement of goods and services in the community, including in massive infrastructure development projects.
7. creating new markets in the sale and purchase of goods and services, driving the growth of private auction businesses and other supporting businesses, for example Appraiser, estimator, warehousing, consulting, auction houses, insurance, credit and so on.

8. Strengthening the budgetary function, namely contributing to Non-Tax State Revenues in the form of Auction Fees, proceeds from the sale of state assets, confiscated goods to the state, gratification goods, found items, traffic raid vehicles and securing tax revenue in the form of income tax on income from diversion land and / or building rights, and BPHTB.

IV. CLOSING

Strengthening the budgetary function, namely contributing to Non-Tax State Revenues in the form of Auction Fees, proceeds from the sale of state assets, confiscated goods to the state, gratification goods, found items, traffic raid vehicles and securing tax revenue in the form of income tax on income from diversion land and / or building rights, and BPHTB.

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Effect of Commitment, Self-Efficacy, Motivation and Effectiveness on the Work Productivity of Public Middle School Teachers in North Minahasa Regency

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Abstract: This study aims to determine the effect of commitment, self-efficacy, motivation, effectiveness on the work productivity of teachers of Public Middle Schools in North Minahasa district. This research uses a quantitative research approach with a survey method with causality study techniques and uses path analysis, which is a pattern that shows the influence of variables with a sample taken from teachers in state junior high schools in North Minahasa regency by cluster random sampling of 120 people. The research variables used are three exogenous variables (variables that have no cause) namely, Commitment (X1), and Self-Efficacy (X2), Motivation (X3) and two endogenous variables (intermediate or intervening variables) namely: effectiveness (X4), and work productivity (Y). This study analyzes the work productivity variables of Junior High School Teachers in North Minahasa Regency, commitment, self-efficacy, motivation and effectiveness, both direct and using intermediaries. So in this study discusses the causal influence between 10 variables directly or indirectly. There is a positive and significant direct effect between Commitment and Work Productivity of State Junior High School teachers in North Minahasa District. and the real level $\alpha = 0.05$ obtained t table = 1.9801. Because tcount 5.403 1,9 table 1.9801 then the hypothesis H0 is rejected, meaning that Commitment (X1) has a direct positive effect on work productivity (Y). There is a positive indirect effect between self-efficacy and productivity through effectiveness. namely 0.388 and the effectiveness coefficient on teacher work productivity is 0.191. So the coefficient of the indirect effect of commitment (X1) on work productivity (Y) through effectiveness (X4) is $0.388 \times 0.191 = 0.074$. So that the total indirect effect is $0.197 + 0.074 = 0.270$, this indicates that the indirect effect is greater than the direct effect.

Keywords: commitment, self-efficacy, motivation, effectiveness, teacher work productivity

CHAPTER 1 INDRODUCTION

A. Background

Education is the spearhead of the progress of a nation. Developed countries have made education as a strategic factor in creating the progress of their nation. Quality education can produce quality and productive human resources. This encourages a country to become a developed and rapid country in development and technology. The development of science and technology has brought changes in almost all aspects of human life where various problems can only be solved except through the mastery and improvement of science and technology. In addition to the benefits for human life on the one hand, these changes have also brought people into an era of increasingly fierce global competition. In order to be able to play a role in global competition, the Indonesian people need to continue to develop and improve the quality of their human resources, improving the quality of human resources is a reality that must be planned, directed, intensive, effective and efficient in the development process so as not to compete in the era of competition globalization. Related to the quality of human resources, education plays a very important role in the process of improving the quality of human resources. Improving the quality of education is a process that is integrated with the process of improving the quality of human resources themselves. Measuring productivity in the field of education is not an easy matter because education is a non-profit sector that does not measure its output by profits or nominal money but by conducting guidance to humans, so to find out the level of

success requires quite a long time. A school that is centered to provide intellectual supplies, attitudes and skills to students requires a long process to arrive at a conclusion that the training done by teachers in schools is successful or unsuccessful.

One factor in the success of an area is seen from the quality of the education sector. To produce quality education, teachers are needed to do it and are professional. Educational organizations that can be regarded as a forum for achieving national development goals are schools. The success of the school and the educational goals depend on the principal, teachers, students, administrative and education staff, school committees, parents of students, school-related people, and adequate infrastructure.

At present there are still many teachers who have not been creative and productive, only become teachers who are limited to teaching, there are still many things that can be developed from the subjects they take. Even the teacher can become a reliable entrepreneur in the field of education. In the field there are teachers who become motorcycle taxi drivers and traders so that they are far from creative and productive. Being a productive teacher is a creative teacher who is never satisfied with the learning carried out. The teacher must conduct self-reflection through research conducted in his own class.

The decline in the productivity of the performance of junior high school teachers in North Minahasa Regency with its weaknesses includes: lack of responsiveness of strategy, lack of discipline, lack of resources, lack of skills, no taste, as long as material is stacked, content is very weak. School facilities meet the standards, but teachers do not meet the standards, and have many shortcomings, it can make education difficult to progress. The statement indicated that many teachers in North Minahasa Regency were inactive, creative, innovative, and low motivated, which would certainly have an impact on low work productivity. There are still teachers in North Minahasa Regency who have not mastered what the main tasks of a teacher are. The ability to produce products is still low where there are still many who do not understand how to make lesson plans, assessments and even lack of confidence to open classes without supervisors present to supervise.

According to Soenarto (2002), the lack of success of the trainings that have been carried out to improve the quality of work so far has been allegedly caused by the planning and implementation of training that does not support the achievement of objectives, training materials do not fit the needs of teachers, and the implementation of training is not supported by adequate facilities. The unsuccessful training of teachers in positions so far has been caused, among others, by the training activities not being held on the basis of the real needs of teachers in the field or not starting with the proper need assessment and in the selection system the training participants have not been carried out with the right system. This results in a low level of equal opportunity for training. This phenomenon occurs due to the mapping of qualifications and competency mapping databases of educators in the Department of Youth and Sports Education is very weak. Implementation of the results of training by teachers in learning in schools is still not optimal, so the system of monitoring and evaluation of the implementation of training results by teachers in the classroom, both by the principal or supervisor is still lacking. The low motivation of teachers to work to develop themselves and achievement because of the lack of a supportive system, thus learning activities are really intended to overcome the failure of students to learn. Learning activities can only be changed through testing the teaching and learning activities of teachers and analyzing their impact on student learning. The teacher professional development program requires facilities that can provide opportunities for them. Based on the thoughts that have been stated previously, researchers are interested in conducting research on the Work Productivity of Junior High School Teachers in North Minahasa district and its relationship to Commitment, Self-efficacy, Motivation and Effectiveness.

Formulation of the problem Based on problem identification and problem limitation, this research study can be formulated as follows: 1. Does commitment directly influence the effectiveness of the Public Middle School Teachers in North Minahasa Regency? 2. Does commitment directly influence the work productivity of teachers of state junior high schools in North Minahasa Regency? 3. Does self-efficacy directly influence the effectiveness of the Public Middle School Teachers in North Minahasa Regency? 4. Does self-efficacy have a direct effect on the work productivity of Teachers of Public Middle Schools in North Minahasa Regency? 5. Does motivation directly influence the effectiveness of Public Middle School Teachers in North Minahasa Regency? 6. Does motivation directly influence the work productivity of State Junior High School Teachers in North Minahasa Regency? 7. Does effectiveness directly influence the work productivity of the Public Middle School Teachers in North Minahasa Regency? 8. Does the commitment have an indirect effect on the effectiveness of the Public Middle School Teachers in North Minahasa Regency? 9. Does self-efficacy have an indirect effect on the effectiveness of Public Middle School Teachers in North Minahasa Regency? 10. Does motivation affect indirectly on the effectiveness of Public Middle School Teachers in North Minahasa Regency?

Benefits of research The results of this study can be used as information and study material for all parties, especially in the education unit environment in North Minahasa Regency. Academically, it can produce empirical proportions about the ability of teachers that allow it to be further developed into a theory, in order to broaden educational knowledge about learning.

CHAPTER II THEORITICAL REVIEW

A. Conceptual Description

1. Productivity

The concept of work productivity can be seen from two dimensions, namely the individual dimension and the organizational dimension. The individual dimension sees productivity in relation to individual personality characteristics that emerge in the form of mental attitudes and implies the desire and efforts of individuals who are always trying to improve the quality of their lives. While the organizational dimension looks at productivity in terms of the technical relationship between inputs and outputs. Therefore in this view, the increase in productivity is not only seen from the quantity aspect, but can also be seen from the quality aspect (Masofa, 2008). The meaning of work productivity was originally conveyed by Qesney, a French economist in 1776. This concept is widely known in the economic and industrial fields. In an economic context, productivity refers to the results obtained in the production process by using one or more factors of production (Kohler in Mulyono, 1993). This means that an organization is said to be productive, if it produces a lot of products. The more products produced the more productive the organization is. Barner (1980) emphasizes productivity in the context of achieving goals. Handoko (1999) says that the fulfillment of the right job with the concentration of human resources and effort on the job can affect organizational productivity. Productivity in an organization largely depends on the motivation of its members where the actions of members are directed towards the achievement of organizational goals. In line with that, Hiks (in Winardi, 2000) said that productivity is a function of motivation. Motivation according to Hiks can be positive or negative, this shows that if motivation is positive can encourage increased work productivity. Conversely, if motivation decreases it can reduce work productivity. The productivity of school organizations is largely influenced by the work productivity of teachers. Therefore, teacher work productivity must be a concern of school principals as leaders, because the high and low levels of teacher work productivity can affect the achievement of overall school organizational goals. The principal must continue to encourage teacher motivation to increase teacher work productivity. There are many factors that affect the level of productivity of one's work. According to Sukarna (1993: 50), the factors referred to, among others; (1) ability and agility of employees, (2) managerial skills or abilities of company leaders, (3) good work environment, (4) good community environment, (5) work wages, (6) work motivation to achieve work performance, (7) employee work discipline, (8) political or security conditions and state order, (9) unity and unity between workers' groups, (10) a country's culture, (11) education and work experience, (12) worker health and safety employees, (12) work facilities, and (13) company policies and administrative systems.

As according to Koster (2001: 25), factors that influence teacher work productivity; (a) factors originating from within the teacher such as motivation and ability, (b) factors originating from schools or institutional organizations, and (c) environmental factors. The description of the factors influencing the work productivity in question can be drawn at least two main components that contribute significantly to work productivity, namely competency, organizational culture and work motivation. Someone who becomes an educator must have special abilities and meet the criteria desired by the world of education itself. According Siswoyo, et al (2008: 119) the requirements of an educator are; (1) having a feeling of being called as a sacred duty, (2) loving and caring for students, and (3) having a sense of responsibility that underlies their duties. When these three conditions have been met it will automatically make the teacher motivated and motivated to carry out their main tasks as well as possible. This motivation is very important as a basis to pursue a profession because only people who have the determination, enthusiasm and maximum responsibility in carrying out their work Dangkua research (in Tolla, 1991) reports that teacher work productivity can increase between 35% -40% through the influence or encouragement of school principals, and about 60% -65% is determined by the personal ability of teachers.

Tolla's research (1991) reports that teacher work productivity is a comparison between the principal's leadership and the optimal empowerment of the teacher's potential and the ability of the teacher himself. Research on teacher productivity was also conveyed by Usa (2002) that there was a significant relationship between teacher work motivation and teacher work productivity at State High Schools in Muna District. The results of this study are strengthened by Daryono's (2006) study which states that there is a significant relationship between teacher work motivation and teacher work productivity in public elementary schools in Probolinggo. Teacher work productivity is the potential or power produced by the individual (teacher) that is used to the maximum, to achieve more output, creative, generative, and generate profits or usefulness. Measurements are made through sub-variables: (1) planning and implementing learning, with indicators of teaching design, semester programs and annual programs; (2) academic achievement, with indicators of academic work and monumental work; (3) professional development work, which includes indicators of research articles, the making and use of media, and learning tools; and (4) participation in scientific forums, with indicators on workshops, training, speakers, and seminar participants. Based on the understanding described earlier, it can be concluded that the task of the teacher is not just teaching, but starts from the planning, implementation, evaluation, evaluation, and enrichment pr Teacher work productivity contained in the main tasks in accordance with Minister of Education and Culture 2018 and teacher functions in accordance with Ministry of Education and Culture 2018 Article 3 paragraph 2 for teachers covers the main activities: a. plan learning or guidance; b. carry out learning or guidance; c. assess learning outcomes or guidance; d. guide and train students; e. carry out additional tasks attached to the implementation of main activities according to the workload of the teacher. The task of the teacher helps and is responsible to the principal in teaching and learning activities, including: (1) making teaching completeness properly and completely, (2) carrying out learning activities, (3) carrying out assessment activities of learning processes, daily tests, general tests

and final exams, (3) carrying out analysis of the results of daily tests, (4) compiling and implementing improvement and enrichment programs, (5) filling out a list of students' grades; (6) carrying out guiding activities (scoring knowledge), to other teachers in the learning process; (7) making learning tools / teaching aids; (8) fostering an attitude of respect for works of art; (9) participates in curriculum development and socialization activities; (10) carrying out certain tasks in school; (11) developing a learning program; (12) make notes about the progress of student learning outcomes; (13) fill out and examine the attendance list before starting the lesson; (14) regulates the cleanliness of classrooms and surroundings; and (15) collecting and calculating credit points for promotions.

Teacher teaching attributes include intelligence, preparation, teaching organization, and clarity of teaching objectives. Teacher work productivity in secondary schools has become a question lately, it is evidenced by the results of the graduation of students on the national examinations in the last two years that have decreased significantly. Berry and Houston in Ahab (2012: 6), provide an explanation that productivity can be realized if there is a combination of abilities possessed by businesses that can be done to produce what can be done. A good combination of these two aspects leads people to become individuals who are never satisfied with what they have done, continue to look for renewable methods or information to increase their capacity and competence so that they can be classified as productive individuals. Productive people are those who continue to learn and feel the capabilities they have and make improvements continuously so that they can produce something useful. The intended task is not easy to do, if the teacher does not have good work professionalism.

Every organization generally has a goal to be achieved, both short-term or long-term goals. Barner (1980) says organizational productivity can be measured by comparing output with input. Quantitatively, productivity is the ratio between the results obtained and the sacrifice of all resources expended to produce output. That is, how much the ability of an organization can achieve the goals set by using existing resources effectively and efficiently. Rohiat (2008) said productivity can be seen from two angles, namely individuals and organizations. From an individual's point of view, productivity can be seen as a potential contained within the individual that is used to its full potential without dependence on other parties. While Gilmore (in Rohiat, 2008) stated that productivity is the quality or power produced, bringing outputs that are more, creative, generative, and generate profits. Thus, productivity is related to creativity. While productivity from an organizational standpoint is a collection of individual productivity in the organization.

The Singapore National Productivity Board Formulation (in Sedarmanti, 2001) defines productivity as a mental attitude that has a passion for improvement and improvement. Sedarmayanti further said that productivity implies that mental attitude that always has a view of the quality of life today must be better than yesterday, and tomorrow must be better than today. Productivity can be interpreted as a comparison between the results achieved (output) with all the resources used by the union of time. Based on the definitions described earlier, it can be concluded that work productivity implies: (1) individual resources or potential (input); and (2) the results achieved (output). Work productivity is the potential or power produced by individuals that are used maximally to achieve outputs that are more creative, generative, and generate profits or benefits. The concept of productivity is closely related to efficiency and effectiveness (Gomes, 2000). High effectiveness and efficiency will produce high productivity. And if the effectiveness and efficiency are low, it is assumed that there has been a management error. If the effectiveness is high but the efficiency is low, it is possible to waste (high costs), while if the efficiency is high but the effectiveness is low, it means that the target has not been achieved or there has been a deviation from the target. Productivity measurement involves complex and interdisciplinary issues. The fundamental factors that influence productivity achievement are investment positions, both capital, technology, management, and the skills of the workforce (Sinungan, 1997).

Management factors include the way and process of moving others to specific goals. The workforce skills factor is related to the ability possessed by the workforce, work motivation, discipline, work ethic and interpersonal relationships. Measurement of educational productivity can be done in three ways, which are seen from: (1) dimensions of administrative output, (2) dimensions of behavioral change output; and (3) economic output dimensions. The measurement of the dimensions of administrative output means by looking at how good the service can be provided by the teacher, as well as other interested parties. The dimensions of administrative output for teachers can be in the form of teaching and learning products ranging from teaching preparation to teaching evaluation. While the measurement of the output dimensions of behavior change is done by looking at the values obtained by students as a picture of academic achievement that has been achieved. The measurement of the economic output dimension is d A review of productivity studies shows that responsible management skills are one of the most important factors in achieving high productivity in technology-based organizations (Timpe, 1989). Timpe (1989) reviewed hundreds of study findings and insights from thousands of managers participating in a seminar on productivity, suggesting seven keys to achieving high productivity, namely: (1) expertise, responsible management; (2) extraordinary leadership; (3) organizational and operational simplicity; (4) effective teacher training; (5) challenging tasks; (6) planning and controlling objectives; and (7) special managerial training. The teacher's work productivity can be viewed from the teacher's tasks contained in the main tasks and functions of the teacher. Types of teacher assignments as listed in Government Regulation Number 74 of 2008 concerning Teachers and Supervisors Article 52, include: (1) planning learning; (2) implementing learning; (3) assessing learning outcomes; (4) guiding and training students; and (5) carrying out additional tasks (Dirjen PMPTK).

The main tasks and functions of the teacher are to help and be responsible to the principal in teaching and learning activities, including: (1) making teaching completeness well and completely, (2) carrying out learning activities, (3) carrying out learning process assessment activities, daily tests, tests general and final exams, (3) carry out analysis of the results of daily tests, (4) compile and carry out improvement and enrichment programs, (5) fill out a list of students' grades; (6) carrying out guiding activities (scoring knowledge) to other teachers in the learning process; (7) making learning tools / teaching aids; (8) fostering an attitude of respect for works of art; (9) participates in curriculum development and socialization activities; (10) carrying out certain tasks in school; (11) developing a learning program; (12) make notes about the progress of student learning outcomes; (13) fill out and examine the attendance list before starting the lesson; (14) regulates the cleanliness of classrooms and surroundings; and (15) collecting and calculating credit points for promotions. Teachers' tasks are not only based on Government Regulation No. 74/2008 concerning Teachers Article 52, but in developing their skills and knowledge, teachers are currently required to carry out research, especially Classroom Action Research (CAR), training and workshops, and development of instructional media. Teacher work productivity is a form of understanding and application of teacher competencies, including professional competence (Mulyasa, 2008).

Teacher professional competencies include (1) understanding National Education Standards; (2) developing curriculum, including developing syllabi, developing lesson plans, implementing learning, and evaluating learning outcomes; (3) mastering standard materials, namely learning materials and deepening materials; (4) managing learning programs, including formulating objectives, describing basic competencies, selecting and using learning methods, compiling procedures, and implementing learning; (5) managing classes; (6) using media and learning resources, which include creating and using learning media, making learning tools, and managing and developing laboratories; (7) understand and carry out student development; (8) understanding and organizing school administration; (9) understanding research in learning, including developing research designs, carrying out research, and using research results to improve the quality of learning; (10) displaying the example and leadership in learning; (11) developing theories and basic concepts of education; and (12) understanding and implementing individual learning concepts. Based on the opinion of Mulyasa (2008) it is clear that a teacher not only plans and implements learning, but also designs and implements research, makes media and applies it in learning, and designs, implements and applies research in the teaching and learning process. one by linking education services with financing aspects.

Arikunto (1993) argues that professional competence requires teachers to have broad and deep knowledge about the subject matter (fields of study) to be taught, as well as mastery of methodology that is mastering theoretical concepts, as well as choosing appropriate methods and being able to use them in teaching and learning. The teacher's professional competence is reflected in indicators: (1) the ability to master subject matter, (2) the ability to research and compile scientific papers, (3) the ability of professional development, and (4) understand and be able to utilize communication technology to stop learning. Suparlan (1997) stated the role and task of the teacher are as follows: (1) the role of management (the management role), with the main task: (a) knowing the background, socio-economic, and academic intellectuals of students, and (b) knowing the individual differences of students, the potentials, and weaknesses of students, including their learning; and (2) the instructional role, which includes the main tasks: (a) conveying knowledge and skills, (b) understanding students' responsibilities, discipline, and productivity; (c) respect and love towards students; (d) conveying moral values and humanity in all its steps; (e) encouraging students to be innovative, creative, and understand differences in individuality; (f) provide examples for students, both their words and behavior; and (g) teaches environmental care and understands the development and application of knowledge and technology in modern life.

Kamaruddin Haji Husin (in Suparlan, 1995) explained the nine roles of the teacher and the tasks that had to be carried out in various aspects, as follows. 1), educators, who have the task of developing personality and fostering character. 2), instructor, in charge of delivering knowledge, training skills, providing aging or direction; combining knowledge, guidance, and skills provided; design teaching; carry out learning; and assessing learning activities. 3), the facilitator, whose task: motivating students, helping students, guiding students in the learning process inside and outside the classroom, using appropriate learning strategies and methods, using questions that stimulate students to learn, providing teaching materials, encourage students to look for teaching materials, use rewards and punishment as an educational tool, and realize discipline. 4), the supervisor, who has the task: giving instructions or guidance about the learning styles of students, look for strengths and weaknesses of students, provide training, give appreciation to students, recognize the problems faced by students and find ways to solve them, help students to discover students' talents and interests, and recognize individual differences of students. 5), the waiter, whose job: providing comfortable and safe learning services according to individual differences of students, providing learning facilities from schools (such as classrooms, tables, chairs, blackboards, cupboards, teaching aids, notice boards), and providing services Learning Resources. 6), the designer, which involves the task: compile teaching and learning programs based on the applicable curriculum, compiling teaching plans, and determining learning strategies and methods in accordance with the concept of PAIKEM (Active, Innovative, Creative, Effective, and Enjoyable Learning). 7), the manager, who has the tasks: carry out class administration, carry out class presence, and choose effective learning strategies and methods. Eighth, innovators, who have the task: find effective teaching strategies and methods, improve abilities and skills in using teaching strategies and methods, and are willing to try and implement new learning strategies and methods. Ninth, assessors, whose duties: compile tests and other assessment instruments, carry out assessments of students objectively, conduct remedial learning, and conduct enrichment in learning.

he tasks of the teacher according to Melisa (2008), include: (1) planning, developing, and organizing learning; (2) taking attendance and recording the attendance of students; (3) managing student behavior; (4) presents subject matter; (5) assessing learning outcomes; and (6) evaluating the learning process.

Based on the above studies, teacher work productivity is not only: making teaching completeness well and completely, carrying out learning activities, carrying out learning process assessment activities, daily tests, general tests and final exams, carrying out analysis of daily test results, compiling and implementing programs improvement and enrichment, fill in the list of values of students; carry out guiding activities (scoring knowledge) to other teachers in the learning process; making learning tools / teaching aids; foster an attitude of respect for works of art; participate in curriculum development and socialization activities; carrying out certain tasks in school; conduct learning program development; make notes about the progress of student learning outcomes; fill out and examine the attendance list before starting the lesson; regulate the cleanliness of classrooms and surroundings; and collecting and calculating credit points for promotions; but the teacher must also conduct research, especially classroom action research to improve learning, write articles in magazines or journals, create learning tools and media for use in the learning process, guide students and more junior peers, and participate in scientific forums, namely workshops, training, discussions, seminars, and so on.

2. Commitment

Sahertian (1994: 44) defines work commitment as a tendency in a person to feel active with a sense of full responsibility. With such high commitment, someone who is actively involved with full responsibility in an occupied job will be able to determine his own decision and carry out the work with sincerity. Commitment is also a decision or agreement of someone with himself to carry out or not do something work. Someone who already has a commitment so he does not hesitate in determining the attitude of responsibility for the decisions taken.

Sahertian (1994: 87) explains that commitment and care can arise if there is a love of duties and responsibilities. Everyone naturally has a commitment. But everyone's commitment will never be the same. There are people who have low work commitments and some who have high work commitments. This will be determined by the different levels of development and psychiatric processes of the scientific system. According to Nawawi and Martini (1993: 160) explains the determination to do a job is considered and believed to be a commitment. Commitment is also interpreted as a determination in a person to accept or reject one or more goals, and determine actions or activities. Someone who has made a determined commitment to himself will be able to work hard. The principle and determination to always do it always manifests as a responsibility that is in accordance with what is said, and not only for his interests.

Israel (1990: 78) says a person's commitment can go up and can also go down on his job that is strongly influenced by attitude. The positive attitude at work makes someone feel at home working and able to survive as a member of the organization. A person's sense of concern for the tasks and general interests of the organization, and not just because of personal interests, will make a very meaningful contribution to the organization. According to Luthans (2008), in general, commitment involves an individual's attachment to his work. Commitment is a variable that reflects the degree of relationship that is considered owned by an individual towards a particular job in the organization. The issue of commitment is the same as the issue of responsibility, thus, a measure of commitment is the implementation of tasks in accordance with applicable regulations. In general, Spector (2002) gives the following picture of commitment; involves the attachment of individuals to their work, which is a variable that reflects the degree of relationship that is considered owned by individuals to certain jobs in the organization. Greenberg (2008) and Baron (1993), say their opinions about commitment reflect the level of identification and involvement of individuals in their work and their unwillingness to leave the job.

Porter and Smith in Setiawati (2007), commitment is the nature of an individual's relationship with an organization that allows a person to have a high commitment by showing a strong desire to remain a teacher of the organization concerned, a willingness to try his best to benefit the organization, and trust in strong acceptance of organizational values and goals.

Gibson, Ivancevich and Donnely (2006), said that the commitment of attraction is "a sense of identification, involvement, and loyalty or loyalty expressed by someone towards the workplace". An educational institution is expected to be able to provide the best performance results for its schools in accordance with its competencies. The competency basis is not sufficient for a teacher if it is not supported by a high commitment to provide good performance results in the work environment. In addition to the competencies possessed by educators, workers in the world of education, lecturers, teachers, it is hoped that their cooperation will be able to produce good results for organizations or companies. Competence that runs alone without commitment is like a bullet gun but cannot be used. A teacher who has no commitment is actually like an expert in his field (competent) but works half-heartedly. Teachers who have a commitment, work in total, devote attention, thought, energy and time, will do what is expected by the school. Some of these expert opinions, commitment can be synthesized is an action in a person who will not be violated when carrying out work by upholding goals, a sense of belonging, responsibility and actively participating in the organization. Having linked teacher commitments are: (1) Teacher identification that upholds the vision, mission of the school, school goals and instills confidence in the school, (2) Teacher loyalty which fosters a sense of ownership and is responsible for the progress of education in schools, and (3)

Teacher involvement namely establishing relationships and taking an active role in every learning activity. Indicators of teacher commitment can be good work involvement in schools, have a high loyalty at work, have a sense of pride in schools, attachment to schools and have a high desire to stay in school. Based on the intended understanding, the researcher believes that the teacher's commitment is a sense of identification, involvement, loyalty / loyalty, the degree or nature of the relationship of a teacher to students as indicated by learning achievement, interest in improving graduate quality, and strong self-confidence in values education values and objectives.

3. Self Efficacy

Someone will try to do certain tasks that he perceives can be carried out and he will avoid situations and behaviors that he perceives outside the limits of his ability (the strength of belief), which is related to the strength of individual beliefs over his abilities. Strong and steady expectations of individuals will encourage persistent efforts to achieve goals, even though they may not have supporting experiences. On the other hand, weak expectations and self-doubt about one's abilities will be easily swayed by unsupportive experiences (generality), which are matters relating to the broad scope of behavior where individuals feel confident about their abilities. Individuals can be confident in their abilities, depending on their understanding of their abilities that are limited to certain activities and situations or to a wider and more varied set of activities and situations. Albert Bandura (1986) said that self-efficacy is a person's assessment of his ability to improve performance. In line with the opinion of Luthans (2008) self-efficacy is an individual's belief in his ability to mobilize his motivation, source of knowledge and how to act so that it is successful in carrying out specific tasks in accordance with a predetermined context. In line with the opinion of Greenberg (2008) said that self-efficacy is one's belief in his ability to complete tasks to achieve his goals. The same thing was conveyed by Jennifer (2005) that self-efficacy is a person's belief in his ability to perform specific behaviors successfully. Kinicky (2009) suggests a similar opinion that self-efficacy is one's belief about the likelihood of success in completing specific tasks. Another more specific opinion expressed by Jones, George and Hill, quoted in his book Jalaludin (1998: 105) as follows, "Self-efficacy is one's belief in his ability to display performance successfully" Confidence for self ability according to Jalaludin is related to self-concept, people who have positive self-concept tend to have good self-efficacy. Self-efficacy directs one's behavior at work. Although someone is offered an attractive award for successfully completing a particular task, but the person concerned tends to not accept it if his efficacy is not positive. Conversely, if the positive individual's self-efficacy in question tends to set goals that are difficult to achieve because he is confident in his ability to achieve those goals. Understanding the efficacy associated with human life habits based on character principles, such as integrity, humility, loyalty, self-limitation, courage, justice, patience, crafts, simplicity and politeness that should be developed from within to outside the self, and not by coercion from outside into the individual.

4. Motivation

Motivation can also be said to be a series of attempts to provide certain conditions, so that someone wants and wants to do something and if he doesn't like it, then he will try to negate or avoid the feeling of dislike Sadirman A.M (2014) It is common for people to call "motives" to indicate why someone is doing something. The word motive is interpreted as an effort to encourage someone to do something. The motive can be said as a driving force from within and within the subject to carry out certain activities in order to achieve a goal. Even the motive can be interpreted as an internal condition (preparedness). Starting from the word "motive", motivation can be interpreted as a driving force that has become active. Motives become active at certain times, especially when the need to reach a goal is felt to be urgent. Theory X and Y from Mc. Gregor Motivation theory that combines internal theory and external theory developed by Mc. Gregor. He has formulated two basic differences regarding human behavior. These two theories are called theories X and Y. Traditional theories of organizational life are mostly directed and controlled on the basis of theory X. The assumptions that underlie X theories according to Reksohadiprojo and Handoko (1996: 87) a. The average worker is lazy, does not like to work and if possible will avoid him. b. Because basically does not like working then it must be forced and controlled, treated with punishment and directed to the achievement of organizational goals. c. The average worker prefers to be guided, tries to avoid responsibility, has little ambition, willpower above all else.

The motivating factor that drives each participant is that the teacher is formed from the attitude of the self in the face of the work situation. This includes attitudes towards work situations related to school principals and peers. Teachers who have a positive attitude or agree with the situation of the school environment including management from the school. Teachers who want to be open with increased competency tend to have high motivation so that they will work well and produce satisfying work performance. Conversely, teachers who close themselves or disagree, tend to lack enthusiasm in working and the work is not optimal.

5. Effectiveness

The effectiveness of an individual is a function of two things: what is produced or produced and the assets that produce or the capacity of production, so that a person's effectiveness is a balance between the product / desired outcome with the ability to produce. The definition of effectiveness in question is focused on the balance that should not be ignored. For example, to obtain the desired results must be accompanied by good treatment of people who have tried to achieve it so that their work skills in the long run are maintained. Someone is said to be effective if he can solve problems effectively, maximize opportunities, and continuously learn and integrate other principles in the growth spiral.

The effectiveness of an individual is a function of two things: what is produced or produced and the assets that produce or the capacity of production, so that one's effectiveness is a balance between the product / desired outcome with the ability to produce (Stephen R. Covey: 41-43). The notion of effectiveness that has been described previously is focused on a balance that should not be ignored. For example, to obtain the desired results must be accompanied by good treatment of people who have tried to achieve it so that their work skills in the long run are maintained. Ketut Puspadi (2002), revealed that effectiveness in the context of organizational behavior is the optimal relationship between production, quality, efficiency, flexibility, satisfaction of nature, excellence and development. .

There are two keys to effective person in an organization, someone who understands clearly what he will do or not in every aspect and someone who takes responsibility for thinking about what he needs to do the job. Hadiningrat (1994), said that: Effectiveness is the achievement of goals and various targets that have been set at a sacrifice ratio is smaller than the results achieved.

This implies that the effectiveness implies in achieving a goal and utilizing all available resources appropriately and using all available facilities properly, so as to obtain benefits / benefits from the use of existing resources. Success in achieving a goal that is not accompanied by benefits means that success is not effective individually or in groups. Individually in doing work can not be separated from group life so that the effectiveness of the individual is caused by several factors, including: ability, skills, knowledge, attitude, motivation, and stress. While the causes of group effectiveness include: cohesiveness, leadership, structure, status, roles and norms. While the causes of organizational effectiveness include: the environment, technology, strategic choices, structure, processes and culture. Individuals rarely work alone, in work they always have the nature of dependence with others, therefore one must need another perspective of effectiveness, namely group effectiveness. The effectiveness of the group is simply the total contribution of all members. The third perspective is organizational effectiveness. The organization consists of individuals and groups, therefore the effectiveness of organizational work becomes important in an institutional work community so that it can produce maximum production in accordance with program objectives.

Teacher effectiveness is the maximum involvement of teachers in the process of fostering and enhancing teacher professionalism that is planned and implemented collaboratively in an area to share knowledge and experience, identify learning problems, find solutions, test and develop new ideas for achieving quality improvement in learning. The level of effectiveness of the teacher in following the process of activities to realize the quality of education goals in order to create collaborative learning that makes students enjoy proper learning rights and self-abilities in accordance with learning objectives.

Siagian (1997) said that, "The effectiveness of work is the achievement of goals and various targets that have been set at a sacrifice ratio is smaller than the results achieved".

So the size can be seen from the extent of cognitive, affective and psychomotor development obtained by the teacher in training to be able to develop and change for the better. Likewise, the effectiveness of teachers in implementing it, teachers are said to be effective if there is an ability in the implementation of teaching and learning carried out, so that there is a dynamic balance between the quality and quantity of learning, by utilizing funds and available resources. Conversely learning is said to be ineffective if there is no balance between the quality and quantity of learning with the resources and funds used or in other words a learning process is said to be effective if: (1) there is a change in cognitive behavior in students, (2) there is a balance between the quality and quantity of learning materials, and (3) the learning process can take place by making effective use of available funds. The learning process is said to be ineffective if it cannot meet the learning criteria.

Based on the opinions expressed by experts that have been described previously, it can be synthesized that effectiveness is the achievement of a person in working to realize the goals set by the organization.

Theoretical Framework

1. Commitment and Effectiveness

Commitment as an obligation to stay in the job. This commitment causes teachers to stick to their assignments because they feel obliged to do so and are based on beliefs about what is right and related to morals. The principal must be able to support the teacher, encourage the development of teacher competencies in a sustainable manner, empower the teacher and instill confidence in the teacher to be able to carry out their duties. Carry out their duties properly based on a growing commitment in themselves. Meanwhile the effectiveness of state junior high school teachers in North Minahasa district will increasingly lead to improving the quality of education by requiring commitment.

2. Self-Efficacy and Effectiveness

Self-efficacy provides a clear picture of the ability of teachers in carrying out the task. The role of the teacher who is full of confidence and feels supported by competence will carry out the teaching and learning process that is easy to understand the learning needs of children in the classroom. In line with the goals made by the teacher himself who prioritize children's learning needs and apply collegiality learning, it requires teachers with high confidence to make the teacher effective in the learning process and other activities. Learning programs prepared from the beginning and through a mature planning process are the effects of the teacher's effectiveness. Self-efficacy of each teacher will be able to follow the course of learning activities because the teacher feels confident in his ability to carry out teaching tasks well. The teacher's self-efficacy is a special phenomenon that can be seen as one of the contributions to the effective learning and teaching process.

3. Motivation and Effectiveness

Teachers are motivated to develop competencies and are aware of children's learning rights. Work motivation cannot be observed directly, but work motivation is closely related to physiological needs, social relations and developmental needs. Work motivation is a psychological urge to carry out work. While effectiveness is an effective job if the work gives results that are in accordance with predetermined criteria. Teacher's work motivation will grow because of encouragement from related parties so that they can work optimally and make learning activities effective.

4. Commitment and Motivation

The teacher's commitment will definitely encourage their confidence and enthusiasm for work. The teacher's commitment will launch the school's movement towards change which must be an increase both physically and psychologically, so that it becomes something pleasant for all school members. The teacher's commitment is basically a perception that has the core of loyalty, determination and expectation of a teacher with the demands of a system of assignments that will direct the teacher to act or work according to certain procedures in an effort to carry out their tasks with a high degree of success. Achieving success in teaching assignments requires self-motivation from a teacher so that the implementation of his tasks always departs from his commitment. So that teacher commitments can be used as ideas that encourage teacher work motivation in carrying out their duties. Motivation can also be interpreted as an impulse that arises in a person consciously or unconsciously to do an action with a specific goal or effort that can cause a person or group of people to be moved to do something because they want to achieve the desired goal or get satisfaction with their actions. A professional who can consistently work in a professional manner and from his efforts is getting an appropriate award, of course, will make the work commitment as the basis for achieving the best results on him. Meanwhile, the activities will increasingly lead to improving the quality of education with the commitment of teachers who are very influential in growing work motivation. The old paradigm of increasing the quality of teachers who are fully dependent on block grants has been removed and now leads to changes towards the independence of the teacher himself who prioritizes the commitment of teachers who are aware of these activities because they are motivated by the teacher's motivation to increase competence as a professional educator.

5. Self-Efficacy and Motivation

The teacher's self-efficacy which is high will affect the work motivation of teachers. If a teacher has a high Self-Efficacy then his ability will affect high teaching independence. Teachers who have work motivation is a form of positive attitude or agree with school policy is a confidence that wants to develop in their assignments. Teachers like this have high motivation so that they will work well and produce satisfying work performance. Conversely, teachers who do not agree or do not fit into the situation of school progress tend to lack enthusiasm in working and the work results are not optimal.

CHAPTER III RESEARCH METHODOLOGY

A. Research Objectives

This study analyzes work productivity in terms of the variable involvement of the State Junior High School Teachers in North Minahasa Regency, commitment, self-efficacy, motivation and effectiveness, both direct and using intermediaries. So in this study discusses the causal influence between 10 variables. In general, this study aims to prove the effect of commitment, self-efficacy, motivation and effectiveness on work productivity, directly or indirectly.

Thus the purpose of this study in particular is to study further. 1. Direct influence on commitment to the effectiveness of Public Middle School Teachers in North Minahasa Regency. 2. The direct influence of commitment on the work productivity of State Junior High School Teachers in North Minahasa Regency. 3. The direct effect of self-efficacy on the effectiveness of Public Middle School Teachers in North Minahasa Regency. 4. The direct effect of self-efficacy on the work productivity of State Junior High School Teachers in North Minahasa Regency. 5. Direct influence of motivation on the effectiveness of Public Middle School Teachers in North Minahasa Regency. 6. The direct influence of motivation on the work productivity of Teachers of Public Middle Schools in North Minahasa Regency. 7. The direct effect of effectiveness on the work productivity of Public Middle School Teachers in North Minahasa Regency. 8. Indirect effect of commitment on the effectiveness of Public Middle School Teachers in North Minahasa Regency. 9. The indirect effect of self-efficacy on the effectiveness of Public Middle School Teachers in North Minahasa Regency. 10. The indirect effect of motivation on the effectiveness of Public Middle School Teachers in North Minahasa Regency.

B. Research methods

The research method used was a survey method with causality study techniques and using path analysis, which is a pattern that shows the influence between direct variables. The research data came from respondents through filling in research instruments that had previously been tested before, and will be used to test hypotheses. First, the path analysis requirements test is performed which includes the normality test, the significance test and the linearity of the Regression Mode.

The research variables used are three exogenous variables (variables that have no cause) namely, Commitment (X1), and Self-Efficacy (X2), Motivation (X3) and two endogenous variables (intermediate or intervening variables), namely: effectiveness (X4), and work productivity (Y).

C. Population and Sample

The population in this study was a teacher of state junior high schools in North Minahasa Regency. The sample framework for the trial instrument was taken by drawing or random for each district as many as 40 teachers, and for the determination of the number of samples in this study carried out in a multi-stage sampling using the Slovin formula, namely The number of state junior high school teachers in North Minahasa Regency will represent each UPTD in ten sub-districts as many as 172 people, then with this formula obtained a minimum sample size of 120 people and research interests determined the number of samples of 120 public junior high school teachers in North Minahasa Regency. The details of the number of teachers in North Minahasa Regency.

D. Data collection technique

The data collection technique was carried out using a questionnaire for the teachers in order to assess the Work Productivity of the Public Middle School Teachers in North Minahasa Regency. The questionnaire was arranged based on the variables to be examined, namely, Teacher Work Productivity, Commitment, Self-efficacy, Motivation and Effectiveness. Statement items are built based on indicators of the variables studied by reference to theoretical studies. Each statement item from each variable is equipped with 5 (five) alternative answer choices using a Likert scale.

The instrument was tested before being used in research. The testing of the instrument includes testing the validity (validity) and calculation of reliability (reliability). From the results of testing the validity of using the Biserial Point correlation formula obtained items are valid and invalid. Invalid instruments are discarded or not used in research. As for calculating the reliability of valid instrument items, it is used for further research.

E. Data analysis technique

This study uses statistics as a data analysis tool. Data analysis techniques in this study use path analysis to determine the influence of variables in accordance with the casual model that is formed. The stages of the path analysis technique are as follows: 1) Preliminary analysis using descriptive statistics, which describe the data for each variable partially, descriptive statistics used are average, mode (values that often appear), median (middle value), standard deviations, variances, frequencies and histograms. 2) Test requirements analysis, namely test for normality of error data, significance test and simple linearity regression before hypothesis testing is performed. 3) Hypothesis testing is done using t test analysis.

**CHAPTER 1V
 RESEARCH RESULTS AND DISCUSSION**

A. Research Data Description

Based on the results of data collection through questionnaires given to respondents of 120 people, obtained data description of the variables Commitment (X1), Self-efficacy (X2), Motivation (X3), Effectiveness (X4), and Work Productivity (Y) as shown by Table

Descriptive Data Summary Table of Data

		Komitmen	Efikasi Diri	Motivasi	Keefektifan	Produktivitas Kerja
N	Valid	120	120	120	120	120
	Missing	0	0	0	0	0
Mean		132,1917	132,7333	134,3833	135,4500	134,9083
Median		134,0000	134,0000	137,0000	137,0000	136,0000
Mode		134,00	145,00	138,00	143,00	140,00
Std. Deviation		11,59056	9,98632	9,13041	9,03574	9,97475
Variance		134,341	99,727	83,364	81,645	99,496
Range		60,00	46,00	45,00	43,00	48,00
Minimum		87,00	100,00	103,00	104,00	102,00
Maximum		147,00	146,00	148,00	147,00	150,00

Description of work productivity variable score (Y), Commitment (X1), Self-efficacy X2), Motivation (X3), and Effectiveness (X4), are as follows:

Work Productivity Variable (Y)

The work productivity variable score was obtained from 120 respondents by filling in an opinion of 30 items. Work effectiveness variable is measured by using a Likert scale model of 1 (one) to 5 (five), therefore the lowest score or minimum score for the variable work effectiveness is 30 (1x30) and the highest or maximum score is 150 (5x30). Based on the calculation values described above, the results are obtained for a maximum value of 150 and a minimum value of 102, a mean of 134.90 values that often appear (mode) of 139.00 a median (median) of 136.00 standard deviations 11, 77 and variance of 138.63.

Testing Requirements Analysis

In the path analysis model, the relationship between the variables in the model must be linear. If the relationship between these variables is linear, then this will meet the requirements of regression analysis. For this purpose, a test consisting of a normality test, a variance homogeneity test for each dependent variable, a linearity test and a significance test for both regression and correlation will be carried out.

Calculation of Path Coefficient

Determination and testing of path coefficients is done after going through several steps in path analysis. These steps include (a) determining the structural model of the system being analyzed and (b) testing requirements in path analysis which includes a normality test , homogeneity, significance and linearity.

Structural Model Path coefficient

The structural model based on the theoretical conclusion appears in the figure

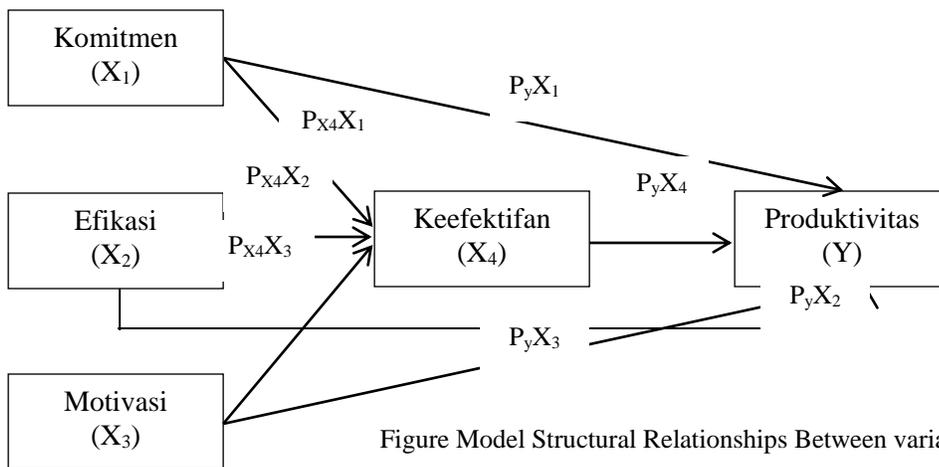


Figure Model Structural Relationships Between variables

Based on Figure there are Ten path coefficients, namely pY1, pY2, pY3, pY4, p41, p42, and p43. Each path coefficient was analyzed for its significance level by analysis of variance (ANOVA). While the significance is tested by t-test (t-test). If the calculation results are not significant then the path is eliminated, likewise if the results of the statistical test t indicate the correlation coefficient does not mean the path is eliminated.

1. Path coefficient calculation results and testing

a. Sub Structure 1

Based on the calculation results, the path coefficient in substructural model 1 is as follows:

Table Structural Path coefficients Table 1
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	2,022	8,105		,249	,803
X1	0,334	0,062	0,388	5,403	,000

X2	0,196	0,077	0,197	2,562	,012
X3	0,254	0,068	0,233	3,749	,000
X4	0,211	0,093	0,191	2,267	,025

a. Dependent Variable: Y

a. Sub Struktur 2

Based on the calculation results, the path coefficient in the substructural model 2

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	22,616	7,813		2,895	,005
X1	0,190	0,059	0,244	3,217	,002
X2	0,478	0,062	0,528	7,665	,000
X3	0,181	0,066	0,183	2,760	,007

a. Dependent Variable: X4

Hypothesis testing

The hypothesis proposed will be drawn conclusions through the results of the calculation of the value of the path coefficient and significance for each path studied. Testing the research hypothesis will be described as follows:

1. Direct Effect of Commitment (X1) on Teacher Work Productivity (Y)

Based on the calculation results in Table 4.18 the path coefficient value $pY1X1 = 0.388$ has a value of $t_{count} = 5.403$ while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and a real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 5.403 > t_{table} 1.9801$, the hypothesis H_0 is rejected, meaning that Commitment (X1) has a direct positive effect on teacher work productivity (Y).

2. Direct Effect of Self-Efficacy (X2) on Teacher Work Productivity (Y)

Based on the calculation of the value of the path coefficient $pYX2 = 0.197$ with a value of t_{count} of 2.562 while the value of t_{table} with degrees of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because t_{count} of 2.562 $>$ $t_{table} 1.9801$, then the hypothesis H_0 is rejected, meaning that Self-Efficacy (X2) has a direct positive effect on teacher work productivity (Y).

3. Effect of direct motivation (X3) on Teacher Work Productivity (X5).

Based on the calculation results in Table 4.18 the path coefficient value $pYX3 = 0.233$ with a $t_{count} = 3.749$ while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 3,749 >$ $t_{table} 1,9801$, the hypothesis H_0 is rejected, meaning that Motivation (X3) has a direct positive effect on work productivity (Y).

4. Direct Effect of Effectiveness (X4) on Teacher Work Productivity (Y)

Based on the calculation results in Table 4.18 the path coefficient value $pYX4 = 0.191$ with a t_{count} of 2.267 while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and a real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{test} 2,267 >$ $t_{table} 1.9801$, the hypothesis H_0 is rejected, meaning that Effectiveness (X4) has a direct positive effect on teacher work productivity (Y).

5. Direct influence on commitment (X1) on effectiveness (X4)

Based on the calculation results in Table 4.19 the path coefficient value $pX4X1 = 0.244$ with a t_{count} of 3.217 while the value of t_{table} with degrees of freedom 91 and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 3.217 >$ $t_{table} 1.9801$ then the hypothesis H_0 is rejected, meaning that Commitment (X1) has a direct positive effect on Effectiveness (X4).

6. Direct Effect of Self-Efficacy (X2) on Effectiveness (X4)

Based on the calculation results in Table 4.19 the path coefficient value $pX4X2 = 0.388$ with a t_{count} of 7.655 while the value of t_{table} with degrees of freedom 91 and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 7.655 >$ $t_{table} 1.9801$, the hypothesis H_0 is rejected, meaning that Self-Efficacy (X2) has a direct positive effect on Effectiveness (X4).

7. Direct Effect of Motivation (X3) on Effectiveness (X4)

Based on the calculation results in Table 4.19 the path coefficient value $\beta_{X3 \rightarrow X4} = 0.183$ with a tcount of 2.760 while the value of ttable with a degree of freedom 119 (n-1 or 120-1) and a real level of $\alpha = 0.05$ obtained $t_{table} = 1.9801$ Because $t > t_{table}$ 2.77 > 1.9801, the hypothesis H_0 is rejected, meaning that Motivation (X3) has a direct positive effect on Effectiveness (X4).

Discussion

Based on the results of the analysis and testing of hypotheses, it shows that of the ten hypotheses proposed, there are seven hypotheses that have direct effect and three hypotheses that have indirect effect. In detail the discussion of research results is described as follows:

First Commitment to Work Productivity. Based on the calculation results in Table 4.18 the path coefficient value $\beta_{X1 \rightarrow Y} = 0.388$ has a tcount = 5.403 while the value of ttable with a degree of freedom 119 (n-1 or 120-1) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because tcount 5.403 > t_{table} 1.9801, the hypothesis H_0 is rejected, meaning that Commitment (X1) has a direct positive effect on work productivity (Y). According to Greenberg and Baron, that work commitment reflects the level of identification and involvement of the individual in his work and his unwillingness to leave the job. Because the work commitment of participants will increase work productivity.

Second Self-Efficacy of Work Productivity. Based on the results of calculations the path coefficient value $\beta_{X2 \rightarrow Y} = 0.197$ with a tcount of 2.562 while the ttab value with a degree of freedom 119 (n-1 or 120-1) and a real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$ Because tcount 2.562 > t_{table} 1.9801 then hypothesis H_0 is rejected, meaning that Self-Efficacy (X2) has a direct positive effect on work productivity (Y). According to Jones, George and Hill as follows, self-efficacy is one's belief in his ability to display performance successfully. Work effectiveness is success in achieving a goal accompanied by benefits means that success is effective individually or in groups. If the individual has high self-efficacy, then the participant will always be confident of being able to carry out their duties properly and be confident of their ability to face various challenges in achieving their work. The participant's confidence in his ability is a determinant of the effectiveness of the participant's work. Based on this it can be stated if self-efficacy is high, then work productivity is also high

Third Motivation on Work Productivity. Based on the results of calculations the path coefficient value $\beta_{X3 \rightarrow Y} = 0.233$ with a tcount = 3.749 while the value of ttable with a degree of freedom 119 (n-1 or 120-1) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$ Because tcount 3.749 > t_{table} 1.9801 then hypothesis H_0 is rejected, meaning that Motivation (X3) has a direct positive effect on work productivity (Y). According to George and Jones, work motivation is an individual psychological impulse to work hard according to the desires found in a person so as to stimulate action according to the achievement of program goals.

The Fourth Effectiveness of Work Productivity. Based on the calculation results in the path coefficient value $\beta_{X4 \rightarrow Y} = 0.191$ with a tcount of 2.267 while the value of ttable with a degree of freedom 119 (n-1 or 120-1) and a real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because t-test 2,267 > t_{table} 1.9801, the hypothesis H_0 is rejected, meaning that Effectiveness (X4) has a direct positive effect on Work Productivity (Y). The effectiveness of work is the achievement of goals or targets that have been set with sacrifice in a ratio smaller than the results achieved. So if participants have high work motivation, it will encourage them to work according to their achievements or targets, causing work productivity to increase.

Fifth Commitment to Work Productivity. Based on the calculation results the path coefficient value $\beta_{X1 \rightarrow Y} = 0.244$ with a tcount of 3.217 while the value of ttableness with a degree of freedom 91 and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because tcount 3.217 > t_{table} 1.9801 then hypothesis H_0 is rejected, meaning that Commitment (X1) has a direct positive effect on work productivity (X4).

Sixth Self-Efficacy for Effectiveness. Based on the calculation results the path coefficient value $\beta_{X2 \rightarrow X4} = 0.388$ with a tcount of 7.655 while the value of ttable with degrees of freedom 91 and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$ Because tcount 7.655 > t_{table} 1.9801 then the hypothesis H_0 was rejected, it means that Self-Efficacy (X2) has a direct positive effect on Effectiveness (X4).

Seventh Motivation for Effectiveness. Based on the results of calculations the path coefficient value $\beta_{X3 \rightarrow X4} = 0.183$ with a tcount of 2.760 while the value of ttable with a degree of freedom 119 (n-1 or 120-1) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because tcount 2.760 > t_{table} 1.9801 then the hypothesis H_0 is rejected, meaning that Motivation (X3) has a direct positive effect on Effectiveness (X4). Work motivation stated by Siagian, is a mental state that encourages, activates, moves, directs and channels behavior towards the organizational goals

The eight indirect effects of commitment to work productivity through effectiveness by multiplying the coefficient of commitment effect on effectiveness with the effectiveness coefficient on productivity. Based on the table the coefficient of commitment to effectiveness is 0.244 and the coefficient of effectiveness on work productivity is 0.191. So the coefficient of the indirect effect of commitment (X1) on work productivity (Y) through effectiveness (X4) is $0.244 \times 0.191 = 0.0466$.

The nine indirect effects of self-efficacy on work productivity through effectiveness by multiplying the coefficient of influence of self-efficacy on effectiveness with the coefficient of effectiveness on productivity. Based on the table the coefficient of self-efficacy of effectiveness is 0.388 and the coefficient of effectiveness for work productivity is 0.191. So the coefficient of the indirect effect of commitment (X1) on work productivity (Y) through effectiveness (X4) is $0.388 \times 0.191 = 0.074$. According to Bandura, self-efficacy is an individual's belief in his ability to take the expected action. Work motivation is a mental state that encourages, activates, drives, directs and channels behavior towards organizational goals.

The ten indirect effects of motivation on work productivity through effectiveness by multiplying the coefficient of influence of motivation on effectiveness with the coefficient of effectiveness on productivity. Based on the motivation coefficient table on the effectiveness that is 0.183 and the coefficient of effectiveness on work productivity that is 0.191. So the coefficient of the indirect effect of commitment (X1) on work productivity (Y) through effectiveness (X4) is $0.183 \times 0.191 = 0.034$. According to George and Jones, work motivation is an individual psychological impulse to work hard according to the desires found in a person so as to stimulate action according to the achievement of program goals. The effectiveness of work is the achievement of goals or targets that have been set with sacrifice in a ratio smaller than the results achieved. So if participants have high work motivation, they will push to work according to their achievements or targets, causing work productivity will also increase by it self.

CHAPTER V CONCLUSIONS AND SUGGESTIONS

A. Conclusion

1. There is a positive and significant direct effect between Commitment and Work Productivity of State Junior High School teachers in Minahasa Utara District. Based on the calculation of the path coefficient value $pY1X1 = 0.388$ has a $t_{count} = 5.403$ while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ is obtained $t_{table} = 1.9801$. Because $t_{count} 5.403 > t_{table} 1.9801$ then the hypothesis H_0 is rejected, meaning that Commitment (X1) has a direct positive effect on work productivity (Y).

2. There is a positive and significant direct effect between self-efficacy and work productivity of teachers of state junior high schools in North Minahasa Regency, based on the results of the calculation of the path coefficient $pYX2 = 0.197$ with a t_{count} of 2.562 while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ is obtained $t_{table} = 1.9801$. Because $t_{count} 2.562 > t_{table} 1.9801$ then the hypothesis H_0 is rejected, meaning that Self-Efficacy (X2) has a direct positive effect on work productivity (Y).

3. There is a positive and significant direct effect between motivation and work productivity of teachers of state junior high schools in North Minahasa Regency, based on the calculation of the path coefficient value $YX3 = 0.233$ with a $t_{count} = 3.749$ while the value of t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 3.749 > t_{table} 1.9801$, the hypothesis H_0 is rejected, meaning that Motivation (X3) has a direct positive effect on work productivity (Y).

4. There is a positive and significant direct effect between Effectiveness and Work Productivity of State Junior High School teachers in North Minahasa Regency. Based on the calculation of the path coefficient value $pYX4 = 0.191$ with a t_{count} of 2.267 while the t_{table} with a degree of freedom 119 ($n-1$ or $120-1$) and the real level $\alpha = 0.05$ obtained $t_{table} = 1.9801$. Because $t_{count} 2.267 > t_{table} 1.9801$ then the hypothesis H_0 is rejected, meaning that Effectiveness (X4) has a direct positive effect on Work Productivity (Y).

5. There is a positive indirect effect between self-efficacy and productivity through the work effectiveness of state junior high school teachers in North Minahasa Regency. Based on the calculation of the coefficient of self-efficacy of effectiveness is 0.388 and the coefficient of effectiveness for teacher work productivity is 0.191. So the coefficient of the indirect effect of commitment (X1) on work productivity (Y) through effectiveness (X4) is $0.388 \times 0.191 = 0.074$. So that the total indirect effect is $0.197 + 0.074 = 0.270$, this indicates that the indirect effect is greater than the direct effect. 6. There is a positive indirect effect between motivation and teacher work productivity through the work effectiveness of state junior high school teachers in North Minahasa Regency. It is known that the direct effect of motivation (X3) on teacher work productivity is 0.233. work productivity is 0.191. So the coefficient of the indirect effect of commitment (X1) on teacher work productivity (Y) through effectiveness (X4) is $0.183 \times 0.191 = 0.034$. So that the total indirect effect of $0.233 + 0.034 = 0.270$ this shows the indirect effect is greater than the effect directly.

Suggestion

1. There needs to be an increase in the commitment of teachers in carrying out their duties and functions through supervision and guidance of school principals. 2. The need for self-efficacy for teachers in carrying out tasks and functions by providing good examples of students. 3. There is a need for self motivation for teachers in carrying out their duties and functions by giving their best and preparing themselves before teaching. 4. The need for effectiveness for teachers to do learning in accordance with general and specific learning objectives. 5. Need to build a good commitment where teaching in accordance with the programs that have been prepared by junior high school teachers. 6. Self-efficacy is needed by implementing a good personality, so that it becomes a good example for students 7. There is a need for high teaching motivation by arranging learning tools in accordance with the curriculum, so learning becomes effective.

8. There needs to be an increase in teacher commitment, and increase effectiveness in learning so that it has a positive impact on work productivity. 9. There needs to be self-efficacy in interacting with students, so that a positive impact on work productivity. 10. It is necessary to increase teacher motivation by developing learning tools in accordance with the curriculum, so as to increase effectiveness in learning and positive impact on work productivity

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The concept of 'Idealism' and 'Transcendentalism' in Browning's monologue "Fra Lippo Lippi"

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Abstract- Fra Lippo Lippi presents a complete statement of Browning's concept of 'Art'. The concept of "Transcendentalism" in which the material world is the symbolic projection of the super sensuous world of immutable ideas. The main argument in the poem is creating art that is realistic, the artist is connecting with a sense of spirituality. We find Lippo explaining his concept of art and defending his thoughts regarding art. Thus, a struggle between 'Realism' and 'Idealism' can be clearly seen in this poem.

I. INTRODUCTION

Even casual readers of Browning's "Fra Lippo Lippi" have noticed that the speaker of the monologue is a man of irreconcilable contradictions. Sworn by poverty, chastity and obedience, he goes out of medici's place and reaches a place "where supporting ladies keep their doors ajar"; obliged as a paint monk, to dedicate his art to portray human soul, he reveals in every look, his fascination for flesh. Lippo affirms that soul and perhaps God may be realised by loving submission to the senses.

Fra Lippo suggests most of the basic concept of transcendental concept of Art. However, before Lippo begins to define his own aesthetic ideas, he emphasizes how wrong his superiors are about the nature and function of Art. The monk wants soul, art, of course, but believes that one gets the soul by distorting reality. Therefore, the Prior tells Lippo - "Paint the soul, never mind the legs and arms" but for Lippo the varying emotions revealed by human face are but varying forms of human beauty:

"Take the prettiest face, the Prior's niece...

Sorrow or joy? Wont beauty go with these?"

The perception of human beauty in the flesh makes one aware of the creative force which produced all beautiful form. For Lippo - "a laugh, a cry" evokes a vision. Thus, the contemplation of the flesh is the best way to awareness of the soul. Even if the perceiver fails to realise the soul(ideal) revealed in the flesh, he may sense it in his own, which is too close to the chaos of raw reality. Instead, he chooses the house of Cosimo of Medici, certainly very much of the world and yet secluded from it. There he finds artistic freedom from monastery control which he needs for full creative expression.

"I am my own master, paint now as I please"

By being both an active participant of life and an objective contemplator of it, Fra Lippo is able to shape the material of the descendant world into a work of transcendent which will awaken both monks and mistresses to the realization that soul and the body

can never be artistically separated. Lippo's love for flesh is justified by his consequent elevation of spirit.

For Lippo, the world is not simply an expression of the spiritual state. It is the only means of perceiving the spiritual and so this world with all its beauty and reality is of material existence that art can hope to grasp at greater truths, higher ideals. Art may become "a way whereby the whole range of mind and imagination can come alive. But that 'way' must begin with some determinable sensory experience.

The artist, must be a man of vitality who actively participates in reality in order to transcribe it vividly and accurately. Fra Lippo is, of course, such a man, not only in his "voracious hunger for new experience" and his "poignant sense of identity" but even in his manner of speech. Lippo suggests that the artist must be sharpened by the means of rather vigorous privation. Only after starving "in the streets eight years" does one learn "the look of things"

The artist's job, according to Lippo, is to recreate the material object as realistically as he can so that he may be elevated to an imaginative perception of the ideal:

"Why can't a painter lift each foot in turn....

Make his flesh liker and his soul like

And then add soul and heighten them threefold?"

In Lippo's opinion a painter should make body "liker" and the soul "more like", both in their order. A painter should give equal importance and attention to both, the body and the soul. It is wrong of the monk to have tried to spiritualize his art when he was yet a lad: "you should not take a fellow, eight years old and make him swear never to kiss the girls". He also said that he can never be a good painter because his work was concerned mainly with the physical aspect and very little with the spiritual side of human beings.

When Lippo joined the convent, he "did renounce the world" for "a mouth full of bread". So, it was after he saw the Prior's niece, that Lippo was able to turn from memory to the living present for his artistic material. Lippo soon felt compelled to seek it restlessly in the streets of Florence. There is no duality. Life and Art cannot be separated artificially.

Art, Lippo said, was given to human beings for a purpose. This world was not meant to be scorned or despised as a disgrace or, as something empty or meaningless. The world had a different meaning and it's meaning is good. The function of an artist is to discover it's meaning and convey it to the world just the way it is. In recognizing the goodness of nature and its beings, we recognise the hand of God. The artist helps us in this process of recognition

because he constantly looks for beauty, may it be physical or spiritual, he finds God in his art.

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Small and Medium-Sized Enterprises

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Abstract- Small and medium-sized enterprises (SMEs) are determined by the number of employees.

This number varies between countries. The designation SME is intended to differentiate businesses with relatively small amounts of capital and personnel from larger organizations. SMEs occupy a very important position in our national economy. They have been playing a major role in global economic and social development. This paper provides a brief introduction on small and medium-sized enterprises.

Index Terms- small and medium-sized enterprises, SME, small and medium-sized businesses,

I. INTRODUCTION

The development of industrial enterprises in the production environment involves in the processing chain businesses of different sizes: large, medium, small, and micro forms. The micro, small, and medium-sized enterprises are becoming more and more important since they contribute to the economic and social stability of the society, generate new jobs, initiate innovation, and ensure a high level of economic competitiveness.

Small and medium-sized enterprises (SMEs) are businesses whose personnel numbers fall below certain limits. The criteria for defining the size of a business differ from country to country. The World Bank defines small and medium enterprises as shown in Figure 1 [1]. In the US, small companies have less than 50 employees, while medium-sized companies have less than 250 employees. Most of businesses are SMEs in both developed and developing countries. Many of these businesses are family-owned and family-operated. SMEs are responsible for driving innovation, growth, and competition in many economic sectors. SMEs are important for economic and social reasons since they create jobs and generate tax revenues [2]. Several stages of SME development are illustrated in Figure 2 [3].

SMEs play an important role in the modern economy. There is widespread consensus on their significant role in economic growth, employment creation, boosting international trade, and poverty alleviation. Factors contributing to the business success of SMEs include the owner-manager's sex, relationship between managers and their employees, financial resources, technological resources, entrepreneurial skills, government support, marketing strategy, business planning quality, and access to information [4].

CHARACTERISTICS OF SMEs

SMEs differ from large businesses in cultural, structural, and strategic ways. The characteristics of SMEs, with an emphasis

on the SME role in employment, employment growth, and economic activity in US, include [5]:

- *Economic activity:* SMEs accounted for approximately half of private nonagricultural gross domestic product (GDP) between 1998 and 2004. Most SME jobs are in the service sector.
- *Number of firms:* SMEs accounted for 99.9 percent of the 27 million employer and non-employer private nonfarm businesses in the United States in 2006. The vast majority of SMEs are firms with fewer than 20 employees.
- *Employment:* SMEs employed roughly half of the 120 million nonfarm private sector workers in the United States in 2006. Employment within SMEs and larger firms grew by comparable rates between 1998 and 2006, and was largely fueled by employment growth in services and construction sectors.
- *Innovation:* SMEs are an important source of innovation processes, products, and services and can be more efficient at producing innovation than large firms.
- *Entrepreneurial opportunities:* SMEs provide important opportunities for all US citizens to develop entrepreneurial skills.

Other characteristics of SMEs include their sustainable development strategies, such as personalized management, a high level of environmental uncertainty, lack of funds, resource constraints, flexibility, horizontal structure, small number and concentration of customers, narrow market, and lack of expertise, which are different from that of large enterprises [6].

BENEFITS AND CHALLENGES

Small and medium-sized enterprises have specific strengths and weaknesses that manifest closely to the involvement of their leaders and their human resources capacities. These dynamic businesses make significant contributions to local economies. They account for a large share of employment, job creation and retention, number of enterprises, increased productivity, innovation, and links with global value chains. SMEs make significant contributions to the US economy and play a major role in US exports. The entrepreneurship that is part of SMEs empowers the citizens for sustainable development. In developing counties, SMEs are one of most powerful economic forces, comprising the lion's share of employment and GDP.

But SMEs face some major challenges. The importance of SMEs and their role in creating a paradigm shift in how business is being done, has been largely neglected in the debate on business and human rights. Gender barriers in the local investment hinders women entrepreneurs from creating jobs. Women are

indispensable economic agents given the fact that they own around 40% of all businesses worldwide. Building a successful SME requires steady access to finance, product, and market information. Governments need to stimulate R&D activities, improve access to venture capital, and provide regulatory, legal, and financial frameworks conducive to entrepreneurship. SMEs have low access to new technologies and lack of management and economical knowledge. SMEs generally compare poorly with larger companies with regard to salaries, fringe benefits, holiday entitlements, training opportunities, and working hours. Decision-makers for SME businesses have limited resources when contrasted to large enterprises. Implementing corporate social responsibility practice represents a considerable challenge for SMEs. SMEs are less aware of the implications of sustainable development. Other challenges include high operational risks, capital constrained, and financial information opaque.

CONCLUSION

Small and medium-sized enterprises (SMEs) are the backbone of economies around the world. They play a key role in ensuring economic growth, innovation, job creation, and social integration. Therefore, encouraging and strengthening innovation in SMEs remains at the heart of policy initiatives for stimulating economic growth and development at the local, regional, national, and international levels. More information about SMEs can be found in the book in [7].

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Enterprise indicators (2/3)	Number of employees	Total assets	or	Total annual sales
Medium	> 50; ≤ 300	> \$3,000,000; ≤ \$15,000,000	or	> \$3,000,000; ≤ \$15,000,000
Small	> 10; ≤ 50	> \$100,000; ≤ \$3,000,000	or	> \$100,000; ≤ \$3,000,000
Micro	< 10	≤ \$100,000	or	≤ \$100,000

Figure 1 Definition of small and medium enterprises by World Bank standards [1].



Figure 2 Stages of SME development [3].

Effectiveness of Leadership On Business Performance of Farmers Agricultural Cooperative Unions in Horo Guduru Wollega Zone, Ethiopia

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Abstract: *The main intent of this study is 'to examine the level of business knowledge of cooperative leaders to enhance Agricultural cooperatives business performances'. The study covers 96 leaders of sampled primary agricultural cooperatives and 192 individual members of primary agricultural cooperatives from members of Chafe buluk farmer's cooperative union and Haragu farmers' agricultural cooperative union. The study were employed both quantitative and qualitative research approach to answer the research question. The pertinent data related to the study was collected with the help of survey questionnaire, key informant interview and focus group discussion from the study participants. The pertinent data collected were analyzed with the help of descriptive statistics and inferential model called multiple regression models. Accordingly, the study result reveals that there were business knowledge gap among leaders of the cooperatives and the 12 variables of leader's business knowledge (LBK) have significant contribution on the business performances of agricultural cooperatives at 0.05 significance level. Therefore, the government and other community development partners should arrange continuous trainings for cooperative leaders on business activities and development of business plan. These actions will ensure the survival and productivity of the cooperatives societies and enhance better cooperatives businesses.*

Keywords: *Business performance, Business knowledge, Cooperatives, Leaders, Members, Regression Analysis*

INTRODUCTION

According to the International Cooperative Alliance ICA (1995), a cooperative can be defined as an autonomous association of persons united voluntarily to meet their common economic, social, cultural needs and aspirations through a jointly owned and democratically controlled enterprise. A cooperative has been defined in various ways and terms according to the diversities of cooperative societies, different understanding, location, the level of engagement in the line of production and function of each type of cooperative at the global perspective. There is no universal definition of a cooperative society. However a cooperative can be defined as an autonomous association of persons who voluntarily cooperate for their mutual, social, economic, and cultural benefits (Najamuddeen et al., 2012).

Leaders are vital ingredient in the success of an organization. Leaders with a high commitment could be a key to the development of an environment that provides organizational effectiveness. Since effective leaders demonstrated to be predictive of attitudes and performance in organizations, the question raised regarding whether other leadership behaviors would also be predictive in the same way or not (Cascio, 2010). The leadership capacity in rural cooperatives directly related to the level of literacy among its members as

leaders usually elected from the member base. In developing countries where the education level is low, this can be a major constraint for cooperative development (Chriwa, 2005). This is shown by African cooperatives failure in the past where corrupt, illiterate and opportunistic leaders drove the cooperatives into financial mismanagement and nepotism (Wanyama, 2009). According to Emanu (2012), the leadership problems in agricultural cooperatives facing in Ethiopia summarized into the following important areas of concern: understanding the use of financial statements, leadership training problems, strategic planning, board/manager relations, legal responsibilities, and performance assessment.

According to Emanu (2012) The most important reasons for cooperative failure in Ethiopia includes; shortage of trained and skilled managers, lack of understanding of the principle and approaches of cooperatives, inability of cooperative member to cope with the modern methods and tools of production, inadequate financing, excessive government control and lack of trust among members. A number of leadership proficiencies problems were perceived encompassing the following: understanding role and responsibilities, potential liabilities of directors, member relations, evaluating strategic plans, evaluating marketing strategies, evaluating financial issues, knowing the principles of cooperatives, as well as a thorough understanding of the mission and objectives of the cooperative.

The Major goal of all leadership development programs is to increase the role of leadership in guiding organizations through periods of uncertainty and change. Erkutlu (2008) argues that the most commonly measure of leader effectiveness is the extent to which the leader's group or organization performs its task successfully and attains its goal. He explains the objective measure of performance or goal attainment are available in the organization; such as profit growth, profit margin, sales increase, market share, return on investment, productivity, cost per unit of output, etc. So, many studies were undertaken on the roles of leadership and behaviors of leadership in different organizations across the world, but there was no research undertaken on effectiveness of leadership on business performance of agricultural cooperatives. In this particular study business knowledge of leaders would be examined in primary agricultural cooperative societies.

MATERIALS AND METHODS

This study were employed a concurrent mixed approach (quantitative and qualitative) approach due to the nature of the study. The researcher convinced that the design could be appropriate for this study, as it is inclusive, and appropriate for collecting both qualitative and quantitative data for the study purpose. The study employed Cross-Sectional survey research design and it is economical, allows comparison of the variables at only one point at particular time (Saunders, 2003).

The study were employed multi stage sampling technique and accordingly, Horo Guduru Wollega zone as an area of study selected purposively because the zone is the area in which more agricultural cooperative societies were highly functioning relative to others. There are two Agricultural cooperative unions in Horo Guduru Wollega zone. The two cooperative unions comprise about 124 primary agricultural cooperative societies. To determine sample primary cooperative societies, (Yamane, 1967) provides a simplified formula to calculate sample sizes. This formula used to calculate the sample sizes of the study. A 95% confidence level and $P = .05$ are assumed and the following formula will be used.

In general, the relevant data required for this study was collected from 288 respondents, from which 96 are chair persons of the sampled cooperative societies and 192 are individual member of the sampled cooperatives taken as a sample size of the study, in addition to these, to collect qualitative data, two FGD with members of Unions' BODs were used and managers of respective cooperative unions were taken as KI.

The type of data used for this study was both quantitative and qualitative data, which was collected from primary and secondary data sources. Primary data was gathered from individual respondents (chairpersons and individual members) with the help of structured survey questionnaire from primary cooperative societies about the leadership effect on their business performance. In addition to these, qualitative data was gathered from board members of the unions and managers of the union with the help of interview checklists administered by researcher. Secondary data sources were collected from published and unpublished materials like Annual Reports, financial reports, webs, etc.

The instruments were constructed to measure the research variables such as extent of knowledge of leaders about basic principles of cooperatives, extent of leaders' business knowledge, leadership traits, leadership skills and training, practices of leader's

responsibilities and cooperatives business performances. The pertinent data was collected from 96 sampled primary farmer’s agricultural cooperative society’s chairpersons, individual members, directors and Managers of respective cooperative unions. To get relevant, accurate and sufficient data for the research questions and objectives, a structured and semi structured survey questionnaire were conducted in selected farmers’ agricultural cooperatives in the study area. **Structured survey questionnaires with five point likert scale** were designed to collect pertinent data to obtain the required result to the objective. The 288 survey questionnaires were prepared and given to enumerators to contact the respondents for collection of relevant data. In addition, checklists designed by researcher and administered by the researcher himself. According to (Kothari, 2004), this method of data collection is very useful in extensive enquiries and can lead to reliable results. Survey questionnaire were designed on the following objective related issues; Basic cooperatives principles, business knowledge, training and skills of leadership and leadership duties and rights and cooperatives business performances. Moreover, to collect detailed qualitative data that helps to cross check the accuracy of data and retain strategic facts to the study, interview schedule and Focus group discussion schedule/checklist were designed.

DATA ANALYSIS

Pertinent data were collected and properly organized and prepared for codification. Following this, the coded data were fed to SPSS software program. The data were analyzed using descriptive statistics like frequency, percentage, mean and standard deviation. The multiple linear regression models were used for this study and presented as follows:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_nX_n + E$$

RESULTS AND DISCUSSION

Demographic characteristics of respondents

The effective survey responses rate was 100%. Therefore, the responses were adequate for further analysis. Upon the rate of the responses, demographic characteristics are presented as; majority of the leader’s respondents (87.5%) were males while the rest (12.5%) of them were females. Regarding the respondents age group, about (47.9%) of them were between 46-55 age group, (45.8%) of them were between the age of 31-45 years, (4.2%) between the age of above 56 years and (2.1%) between the age of 18-30 years. From 96 sampled leaders, about (50%) of them have elementary school education level, about (22.9%) of the leaders were secondary school complete, and about (27.1%) of leaders were illiterate who have no formal education. Regarding committees work experience, about (25%) of the leaders does have 3-4 years experience, (9.4%) of them has 1-2 years experience as a committee and (7.3%) of leaders have less than one year and (6.2%) of the leaders have 2-3 years committee experience respectively.

Leader’s business knowledge to enhance cooperatives business performances

In cooperatives, leadership involves a process of reaching consensus and then following through with the group’s decision. Internal leadership is, therefore, crucial in the implementation of policies and activities, which continually enhance the operations of the cooperatives. Leadership and management, as being important in the effectiveness of cooperatives, should be considered. The board should be able to resolve or choose between the interests of members and to set the overall policies of the organization. Correct decisions and strategies will help to lower the costs associated with these activities, such as the cost of production, decision making and other activities.

Table1 Extent of Leader’s business knowledge to enhance business performances

No	Leaders	1		2		3		4		5	
		Fr	%	fr	%	fr	%	fr	%	Fr	%
1	Understand cost/benefit	8	8.3	44	45.8	26	27.1	16	16.7	2	2.1
2	Knowledge of risk identification	4	4.2	44	45.8	28	29.2	12	12.5	8	8.3
3	Knowledge of cash flow management	18	18.8	24	25	38	39.6	10	10.4	6	6.3
4	Knowledge of risk management	11	11.5	35	36.5	35	36.5	9	9.4	6	6.3
5	Ability of future budget forecast	9	9.4	25	26	19	19.8	37	38.5	6	6.3
6	Understand components	6	6.3	19	19.8	39	40.6	24	25	8	8.3

	of financial plan										
7	Leaders organize bargaining of agricultural outputs	3	3.1	17	17.7	33	34.4	36	37.5	7	7.3
8	Leaders search market to members output	8	8.3	11	11.5	28	29.2	39	40.6	10	10.4
9	Understand use of agri-inputs in productivity	0	0	18	18.8	25	26	19	19.8	34	35.4
10	Surplus distributed to patrons as their transaction	4	4.2	23	24	32	33.3	24	25	13	13.5
11	Aware own strength & weakness in financial decision making	7	7.3	21	21.9	34	35.4	30	31.3	4	4.2
12	Financial statements disclosed to members	5	5.2	30	31.3	34	35.4	26	27.1	2	2.1
13	Able to prepare the society's yearly budget	4	4.2	31	32.3	33	34.4	26	27.1	2	2.1

Source: Survey data, 2019

Note: 1, strongly disagree, 2, disagree 3. Undecided 4. Agree 5. Strongly agree, fr, frequency, %, percentage

As the above table 1 reveals, majority about 45.8% and 8.3% of respondents disagree and strongly disagree about leaders understanding of cost/benefit analysis in the business undertakings and also about 27.1% of respondents undecided about their understanding of cost/benefit of their cooperative businesses. Only about 16.7% and 2.1% of respondents agree and strongly agree to their understanding of cost/benefit of their businesses in their cooperatives. From this result one can deduce that, there is a problem among leaders of the cooperatives in understanding cost/benefit issue of cooperative businesses and this problem in turn affect the performance of the cooperative business activities.

To ensure the success of business of every organization, risk identification and management is so vital. Accordingly, the above table 7 shows, about 45.8% and 4.2% of respondents opined as disagree and strongly disagree about their knowledge of risk identification, and about 29.2% of respondent's undecided about their knowledge of risk identification respectively. Contrary to these, about 12.5% and 8.3% of respondents responded as agree and strongly agree with leader knowledge of risk identification their cooperatives. From this result one can concludes that, there is a knowledge gap among leaders of the cooperatives in identifying risks in their cooperative businesses and this problem in turn affects the performance of the cooperative business activities.

Regarding the respondents Knowledge of cash flow management, about 18.8% and 25% of respondents strongly disagree and disagree respectively and about 39.6% of respondents opined as undecided about their knowledge of cash flow management, while the rest 10.4% and 6.3% of respondents replied as agree and strongly agree with their knowledge of cash flow management. This result indicates that, majority of the leaders have a knowledge gap of cash flow management in their cooperatives and this fact negatively affects their decision making activities and business performance of the cooperatives.

Leaders are responsible to control risks in business organizations through risk identification and management activity. Accordingly, about 36.5% and 11.5% of leader respondents disagree and strongly disagree with their knowledge of risk management. Moreover, about 36.5% of respondents opined as undecided about their knowledge of risk management in their cooperatives. Only the rest 9.4% and 6.3% of respondents agree and strongly agree with their knowledge of risk management in their cooperative business. This shows significant number of leaders gave knowledge gap to manage risk of the cooperative businesses at optimum level and take the cooperative business forward.

Regarding leaders ability of future budget forecasting, about 26% and 9.4% of leader respondents were disagree and strongly disagree with the idea, and 19.8% of participants opined as undecided about their ability of future budget forecasting in their cooperative society. Whereas, about 38.5 and 6.3% of respondents replied as agree and strongly agree respectively. From this result one can deduce that, there is a significant capacity problem of future budget forecasting among leaders of the cooperative societies under investigation, and this fact highly affects the success or benefits of the members.

Regarding leaders understanding about components of financial plan, about 19.8% and 6.3% of leader respondents were opined as disagree and strongly disagree, and about 40.6% of participants opined as undecided about their understanding of financial plan in their cooperative society. Whereas, about 25% and 8.3% of respondents replied as agree and strongly agree respectively. From these result one can conclude that, there is a problem of understanding components of financial plan among leaders of cooperative society. Financial plan is very important for proper functioning of the cooperative business activities and this problem highly affects the success or benefits of the cooperative members.

To ensure economic benefits of cooperative members their agricultural output could be collected at the market price and sold at the right price at the right time and members gain dual benefits. Accordingly, leaders practices in bargaining of agricultural output was seen; about 17.7% and 3.1% of respondents were disagree and strongly disagree about their performance in bargaining of agricultural output of cooperative members and also about 34.4% of respondents were opined as undecided about the leaders practices in bargaining of agricultural output, while the rest 37.5% and 7.3% of respondents opined as agree and strongly agree with the idea respectively. This shows, there is some gap with leaders of agricultural cooperative society in organizing the bargaining of agricultural output and this directly affects the economic benefits of individual members of the cooperatives.

Regarding market search to members agricultural output; about 11.5% and 8.3% of the respondents were disagree and strongly disagree with their practices of searching the right market to members agricultural output and about 29% of respondents were undecided about searching search of a right market to agricultural output of the cooperative members. Whereas, the rest 40.6% and 10.4% of respondents were agree and strongly agree respectively. From this result one can deduce that about 20% of leaders were not good in searching the right market for member's products and about 29% of respondent's undecided about market search. Increase of agricultural output is meaningless unless supported with right market and right market price.

Regarding leaders understanding of the use of agricultural inputs in productivity; about 19.8% and 35.4% of respondents were opined as agree and strongly agree with their understandings of use of agricultural inputs in increasing agricultural productivity. About 26% of respondents were opined as undecided about the concept. Moreover, about 18.8% of respondents were opined as disagree. Even though majority of leaders understand the use of agricultural inputs in increasing agricultural productivity, still some participants understanding about the use of agricultural inputs in productivity have some problems.

Regarding distribution of dividend based on patrons proportional transaction, about 25 % and 13.5% of respondents were agree and strongly agree with distribution of dividend to member patrons based on their equitable participation. Whereas, about 33.3% of respondents were undecided about the distribution of dividend. Moreover, about 24% and 4.2% of respondents were opined as disagree and strongly disagree respectively to the distribution of benefits based on equitable participation. From this result one can understand the availability of problem on dividend distribution to member patrons based on their participation in their cooperatives and this issue severely affects economic benefits of members and the cooperative performance respectively.

As the above table1 indicates, about 21.9% and 7.3% of respondents disagree and strongly disagree with leader's awareness about their strength and weakness on financial decision making. Moreover, about 35.4% of respondents were undecided about leader's awareness about their strength and weakness of financial decision making in their cooperative society. Contrary to these, about 31.3% and 4.2% of respondents opined as agree and strongly agree on the idea respectively. This clearly shows some leaders of cooperative societies under the study have problem of awareness about their strength and weakness in financial decision making. The knowledge of financial decision making is vital for running a successful business, but lack of such knowledge highly affects business performance of the cooperatives and economic advantage of the individual members.

As a principle, financial statements of the cooperatives should be disclosed to everybody who need it, accordingly about (31.3%) and (5.2%) of respondents opined as disagree and strongly disagree about financial statement disclose to members of the cooperatives and similarly about (35.4%) of respondents opined as undecided about the idea. Whereas, about (27.1%) and (2.1%) of respondents were

agree and strongly agree with financial statement disclose to the members. From this result one can understand that, there is a problem of disclosing the financial statements the cooperatives to members, and this problem affect transparency and cooperation among members and leaders of the cooperative society and this in turn affects the business performance of the cooperative society and economic benefits of the members respectively.

As it is stated in the bylaws of cooperative society, leaders are expected to prepare the societies yearly work and financial budgeting. Accordingly, on this particular point, about 32.3% and 4.2% of respondents were disagree and strongly disagree about leaders ability of preparing the society’s work and financial budgeting. About 34.4% of respondents were undecided about the issue. Whereas, about 27.1% and 2.1% of respondents were opined as agree and strongly agree with leader’s ability to prepare the society’s work and financial budget properly. This result shows us that leaders of the cooperative society have problem of ability to prepare work and financial budgets and this problem in turn highly affects the performance the business in general and the individual member in particular.

Table 2 Descriptive statistics of Leader’s business knowledge

Descriptions of variables	N	Mean		Std. Deviation	Skewness		Kurtosis	
		Statistic	Std. Error		Statistic	Std. Error	Statistic	Std. Error
LBK1 knowledge of business cash flow management	96	2.60	.112	1.100	.262	.246	-.348	.488
LBK2 knowledge of risk identification	96	2.75	.104	1.016	.770	.246	-.085	.488
LBK3 knowledge of risk management	96	2.63	.104	1.018	.508	.246	.092	.488
LBK4 future budget forecast and yearly budget development	96	3.06	.115	1.131	-.258	.246	-.991	.488
LBK5 understand the components of financial plan	96	3.09	.104	1.016	-.068	.246	-.321	.488
LBK6 coops bargain agricultural output of members	96	3.28	.097	.948	-.293	.246	-.351	.488
LBK7 capacity to search market to agricultural output of members	96	3.33	.110	1.083	-.601	.246	-.182	.488
LBK8 knowledge of the use of agricultural input in productivity	96	3.72	.116	1.140	-.209	.246	-1.399	.488
LBK9 surplus distributed to patrons based on their transaction	96	3.20	.110	1.082	.053	.246	-.744	.488
LBK10 aware of own strengths and weaknesses in financial decision making	96	3.03	.102	1.000	-.257	.246	-.519	.488
LBK11 Financial statements are disclosed to members	96	2.92	.100	.981	.170	.246	-.511	.488
LBK12 aware of budget year preparation	96	2.91	.094	.919	.023	.246	-.744	.488

LBK13 have knowledge & capacity of leading the coops	96	3.11	.085	.832	-.331	.246	1.069	.488
Valid N (list wise)	96							

Source: Survey data, 2019

Table 2 above describes that, the respondents perceived the leaders business knowledge (LBK) as very essential component to cooperative business performance. Cooperative Leaders are expected to have good business understanding to take the cooperative business forward and improve the socio-economic status of the cooperative members. The high mean score indicates that leaders of the cooperatives have better knowledge of running cooperative business. Accordingly, leaders knowledge of the role of agricultural input in agricultural productivity and leaders capacity to search market to members agricultural output have the mean values of \bar{X} =3.372 and 3.33 respectively. Awareness of leaders about bargaining of agricultural output and surplus distribution to members based on their transaction have mean values of \bar{X} =3.28 and 3.20 respectively. Other four variables like knowledge of leaders budget forecast and yearly budget development, leaders understanding of components of financial plan, leaders awareness of own strengths and weaknesses in financial decision making and knowledge and capacity of leading the cooperative have the mean score of \bar{X} =3.06, 3.09, 3.03 and 3.11 respectively. The remaining five variables have the mean score between \bar{X} =2.60 and 2.92. From these results one can understand that, business knowledge of cooperative leaders is not sufficient to strategically run a business in this very competitive business environment. In addition to this, both key informants opined that the knowledge level of cooperative leaders on running business is very low and challenging.

REGRESSION ANALYSIS

Table 3. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.807 ^a	.651	.375	.263	.651	2.356	42	53	.002

a. Predictors: (Constant), **leaders business knowledge**

b. Dependent Variable: **Business Performance**

In this case the value of $R^2 = .651$ and this means that the model explains 65.1% of the variance in dependent variable (BP). Several residual statistics can be used to assess the influence of a particular case. If a case does not exert a large influence over the model, the adjusted predicted value is very similar to the predicted value when the case is included (Field 2009).

Table 4 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.281	16	.205	2.244	.010 ^b
	Residual	7.219	79	.091		
	Total	10.500	95			

a. Dependent Variable: Business performance

b. Predictors: (Constant), Understand cost/benefit, Knowledge of risk identification, Knowledge of cash flow management, Knowledge of risk management, Ability of future budget forecast, Understand components of financial plan, Leaders organize bargaining of agricultural outputs, Leaders search market to members output, Understand use of agri-inputs in productivity, Aware own strength & weakness in financial decision making and Financial statements disclosed to members

The above ANOVA table reveals us that, the “F” statistic for the model has a significance level of 0.00. This entails that at least one of the correlation between each of the independent variables are not equal to zero.

Table 5 Coefficient

Model	Unstandardized Coefficients		StandardizeC oefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.064	.354		3.440	0.001
Understand cost/benefit	-.152	.059	-.358	-2.564	0.012
Knowledge of risk identification	.056	.056	.147	1.007	0.017
Knowledge of cash flow management	-.042	.049	-.130	-.873	0.015
Knowledge of risk management	.118	.045	.412	2.606	0.011
Ability of future budget forecast	-.164	.049	-.496	-3.308	0.001
Understand components of financial plan	.071	.043	.197	1.650	0.003
Leaders organize bargaining of agricultural outputs	.004	.058	.008	.062	0.051
Leaders search market to members output	.055	.053	.133	1.033	0.005
Understand use of agricultural-inputs in productivity	.090	.058	.232	1.564	0.022
Surplus distributed to patrons as their transaction	-.053	.044	-.168	-1.202	0.033
Aware own strength & weakness in financial decision making	-.066	.046	-.208	-1.454	0.050
Financial statements disclosed to members	-.020	.058	-.042	-.341	0.034
	.015	.045	.040	.331	0.042

a. **Dependent variable:** Business performance

All variables of the leader’s business knowledge are significant at 0.05 significant levels. This result tells us that leader’s business knowledge has significant impact on business performances of the cooperative societies in the study area.

CONCLUSIONS

The results of the study indicates that there is a knowledge gap among leaders of the cooperatives about importance’s of basic cooperative principles in achieving better business performances in cooperative organizations. There are the leader’s business knowledge gaps to enhance cooperatives business performances in the study area. The leader’s business knowledge gaps are on cost/benefit analysis, risk identifications, cash flow management, financial plan components, bargaining agricultural output, searching markets, and preparation of financial budget. Variables of the cooperative leader’s business knowledge have the mean value ranging from ($T=3.57$ to 3.04). As the results of the study indicated, cooperative leaders have problem of leadership skill and training to smoothly run the business of their cooperatives. The cooperative leaders have a gap on; commitment to their cooperatives, business knowledge, lack initiation/motivation to perform their duties, leadership loyalty, leadership integrity, leadership selfishness, management knowledge, corruption, and leadership accountability.

To improve the cooperative leader’s knowledge business knowledge in the cooperatives, the government and other community development partners should arrange and provide continuous training for committees of cooperatives and undertake awareness creation for the large members about cooperative principles and business concepts.

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Genetics Flash Flipbook Based Improve Learning Models: The Validation of Learning Media in University

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Abstract- The learning system in Indonesia should attend the developments and the changed of the 21st century by using information technology in the learning process. One of the efforts in accommodating 21st century learning at IKIP Budi Utomo Malang, especially in Biology Education Study Program in genetics subjects was the development of Genetic Flash Flipbook media with Improve learning models. This study aims to determine the properness of Genetic Flash Flipbook based Improve learning models in preservice teachers. The method used in this study was the development (R&D) method. The results showed that the validity by the material experts was very valid criteria with the percentage 89%, the results of the validity by the media experts were very valid criteria with the percentage of learning media by 88.25%.

Index Terms- Genetic, Flash Flip Book, Learning media, Validation

I. INTRODUCTION

The learning system in Indonesia generally still used conventional media. The conventional media considered less attractive. Consequently, students were getting bored with monotonous and less innovative learning media [1]. Moreover, the learning system in Indonesia should attend the developments and the changed of the 21st century by using information technology in the learning process. Therefore, IKIP Budi Utomo Malang as one of the Higher Education Institutions expected to develop and carry out learning media that omitted for 21st-century life. Education in the digital era must integrated information and communication technology into all subject areas. Accordingly, to meet the challenges of education in the digital era, students must be able to communicate and adapted well. Consequently, students sued to have a higher level of thinking. The development of digitalization has a wide impact on various fields include the education field. In digital learning, the teacher must be able to use technology to support the learning process. Moreover, the learning atmosphere encourages students to make high achievements, work hard, discipline, think creatively and other high values. Optimal delivery of material needs suitable media. The media is a means of channeling messages from the teacher to the students so as to stimulate the mind, and the interests of students performance participating in learning activities [2] However, a lot of obstacles encountered during the learning process in the classroom may result in lowering students' interest and making them feel bored. Learning media has the function to improve the learning process quality that must involve students in thinking so that the learning process can be carried out [3].

One of the subjects on the Biology Education Study Program that difficult, abstract and need the use of learning media was the Genetics subject. The genetic subject now still being an obstacle in various Higher Education Institutions, because students considered genetics was difficult and hard to understand. Many researchers have shown that students have serious misunderstandings about genetics, even after instruction [4]. Also, students assumed genetic full of theoretical, less contextual, and fewer media used. Consequently, the student's understanding and concepts mastering relatively low. Most students thought that genetic was the most difficult, abstract, and frightening subject. The media used in the genetic learning process still limited, consequently the students less enthusiastic, difficult to study and less discussed with others. Based on the results of the interview with the genetic lecturers, it can be concluded that in the genetic learning process less use of learning media. Consequently, students' concept of genetic material was low. Therefore, one strategy claimed to overcome these problems and at the same time may accommodate the 21st-century learning at Genetics subject, was the development of innovative media and learning methods. That innovative media was the Genetic Flash Flipbook media-based improve learning model. This was done because genetics is known to be a subject that is at once both fascinating and difficult for students to understand [5].

Learning media was the part of learning resources, a combination of software (learning materials) and hardware (learning tools) [6]. Moreover, the use of media in the learning process becomes an effort to create more meaningful and quality learning. According to [1], the media use aims to make the learning process more appropriate and efficient. Consequently, education quality improved well. The Association for Education and Communication Technology (AECT) defines the word media as all forms and channels used

to process information. Bretz identified the main characteristics of the media into three main elements, namely sound, visual, and motion. Visuals can be divided into three, namely pictures, lines, and symbols which were a continuum of forms that can be captured by the sense of sight. Learning media was one component of learning that has an important role in teaching and learning activities. Romiszowski in Hamalik formulated the teaching media "... as the carries of massages, from some transmitting sources (which may be a human being or an intimate object), to the receiver of the massages (which is our case is the learner).

One of the innovative media was Flash Flipbook media. Flipbook combined images intended to be inverted to give the illusion of movement and create an animated sequence from a simple, machineless booklet. Ricky Jay, 1994 stated that the idea of a flipbook that was originally only used to display animation now adopted by many vendors for various types of digital applications, such as magazines, books, comics and so on. The popular digital book design now was a digital book with a three-dimensional e-book technology known as a flipbook, where pages can be opened like reading a book on a monitor screen. Textbooks are the most important component of learning. The availability of relevant textbooks will greatly help the teaching and learning process [7].

Making flash flipbook based learning media was done by using open source software, namely the Kvisoft Flipbook Marker. The software used to make the display of books or other teaching materials into a digital electronic book in the form of a flipbook. This software used to convert PDF to flash flipbook with digital page fold effect, this page has the function of making the text and images in digital information either in swf, exe, html, e-mail format, or used as screen saver [8]. Flash flipbook was an interactive electronic book, with the advantage can loaded files in the form of videos, moving pictures, or animations and sounds, so that it will be very helpful in the learning process that can make students not felt bored in learning activities. It was different from other electronic books (e-books) which only in the form of PDF or doc files containing only text and still images. The use of flipbook maker media can increase students' learning interest and can also affect student achievement or learning outcomes. Hidayatullah and Rakhmawati stated that the use of Flipbook could increase students' understanding and learning achievement. The flipbook has the page transition effect, that was expected to attract student learning motivation so that student learning outcomes will be further improved [6].

The development of learning media could be combined with the used of learning models. This combination was expected to help students to visualize a subject matter that abstracts so that students can understand the learning material [9]. One of the learning models that appropriate with the genetic subject was to improve learning models. The improve learning model was one of the learning models based on the theory of cognition and social metacognition. This model first designed by Mevarech and Kramarsky for heterogeneous classes. This model has 3 interdependent components namely metacognitive activities, interactions with peers, and systematic activities of enrichment feedback-improvement. Improve learning model was an abbreviation of Introducing the new concept, Metacognitive questioning, Practicing, Reviewing and Reducing difficulties, Obtaining mastery, Verification, and Enrichment [10].

The steps in applying the improve learning model were as follows [10]: (1) Introducing the new concept where the teacher provides new concepts through questions that build student knowledge; (2) Metacognitive questioning, the teacher gives metacognitive questions to students about the material. Metacognition questioning was a strategy to mediate the reflective thinking and reasoning of students. The metacognition questioning strategy can help students' thinking to reflect their problem [11]; (3) Practicing, where the students practice solving problems given by the teacher; (4) Reviewing and reducing difficulties, the teacher gives a review of the mistakes faced by students during the practice; (5) Obtaining mastery, where the students do the test at the next meeting to find out the mastery of student material; (6) Verification, verifying to find out which students reach the graduation limit and which students have not reached the graduation limit; (7) Enrichment, enrichment for students who have not reached the graduation limit.

The advantages of improving learning models were (1) students more active to do exercises and students free to exploit their ideas, (2) the learning atmosphere more attractive, (3) the explanation at the beginning and the exercises make students have better understand the material, (4) encouraged students' thinking and understanding, (5) students could review the important concepts and, (6) could control and assessed student progress. The Improve learning model stimulating students to learn independently, be creative and be more active in participating in learning activities [12]. It was expected the development of learning media could be the efforts to accommodate the 21st-century learning for students of IKIP Budi Utomo Malang, especially in the Genetics of Biology Education Study Program.

II. RESEARCH METHOD

This research was a research development known as Research and Development (R & D). This research aimed to produce a new product useful in the learning process. Developing Focus Media Parasitology using the Research and Development (R&D) method with the 4 D model (Define, Design, Develop, and Disseminate). This research started from the define stage by identifying material concepts contained in the Flash flipbook media. Then in the design phase, with designed and manufactured the Flash flipbook media. After the Flash flipbook media has been designed and created, the next step was product validation by experts and product trials in the lecture process. Based on the results of this development phase, it can be stated that the product was valid and practical.

Data obtained through questionnaire media. The type of data generated were qualitative data and quantitative data. Qualitative data collected from the suggestions or criticisms written by validators. Subsequently, the product was validated by an expert team, namely, subject matter experts and media experts. The products have been validated subsequently revised in accordance with the advice of expert media. Quantitative data derived from a questionnaire. Questionnaire answers using Likert numbers with four categories of choices namely number 4 means very good, number 3 means good, number 2 means not good, and number 1 means not good. Qualitative data analysis referred to the results of suggestions, criticisms or comments from the validator. Suggestions or comments

from the validator could be followed up or not. This follow-up depended on whether or not the repaired can be done. Quantitative data analysis performed based on the results of the instrument assessment questionnaire with a Likert scale and analyzed with percentage analysis. Based on the results of these percentage values, then compared with the level of qualification assessment to determine the criteria of the instrument and product revision requirements.

III. RESULTS AND DISCUSSION

The results of this study were Flash flipbook media products and data description of the results of the learning media validation. In the define stage, the researcher identified the material concepts contained in Flash flipbook media. The material concept contained in Flash flipbook media was the concept of mutation, DNA repair, Genetic engineering and epigenetic. In the design phase, the design and manufacture of Genetic's Flash FlipBook based on the Improve learning model. Kvisoft Flipbook Maker was a software to make the appearance of books or other teaching materials into a digital electronic book in the form of a flipbook. This software used to convert PDF to flash flipbook with digital page fold effect [13]. The Genetic's Flash FlipBook based on the Improve learning model cover shown in Figure 1. Next, Figure 2. showed the video that inserted on the Genetic's Flash Flip Book. That video helped to introduce the concept to the student. Consequently student would more interested in the material. Figures 3 and 4 showed the step of Improve learning models such as metacognition questioning, practicing, reviewing and reducing difficulties, obtaining mastery, verification, and enrichment.



Figure 1 Genetic's Flash FlipBook based on the Improve Learning model Cover

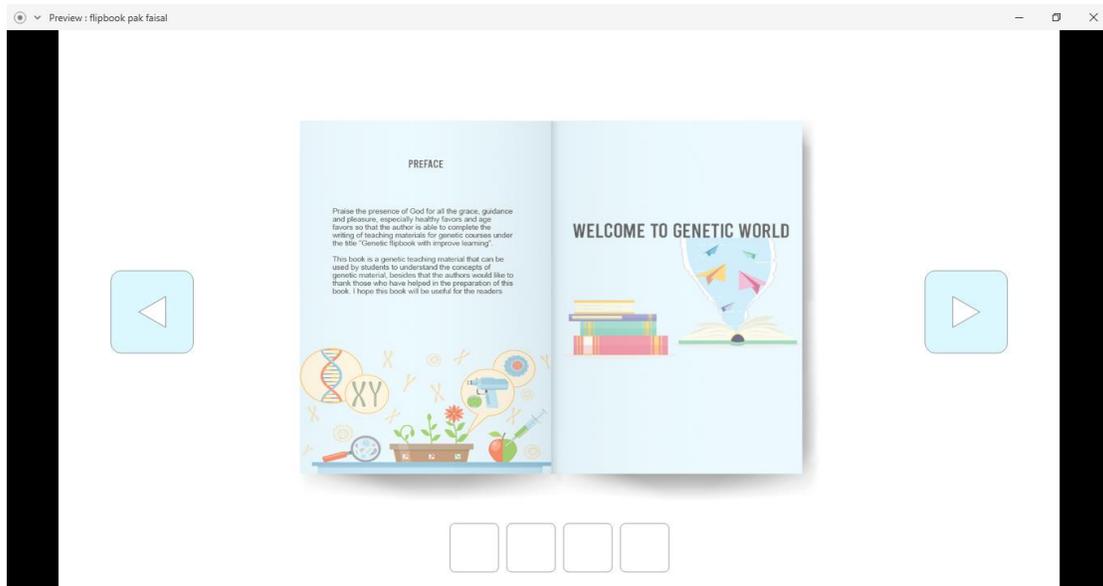


Figure 2 The Genetic's Flash FlipBook based on the Improve Learning Model that Contained a Video



Figure 3 The Step of the Improve Learning Model on Genetic's Flash FlipBook



Figure 4 The Step of the Improve learning model on Genetic's Flash FlipBook

After the Genetic's Flash Flip Book-based Improve learning model finished designed and made, the development stage was carried out namely product validation by media experts and material experts.

Table 1 The Validation Result of Material Expert

No	Feasibility Criteria	%
1	Material compatibility with competence	90
2	Material accuracy	80
3	Material update	90
4	Encourage curiosity	100
5	Presentation technique	100
6	Supporting the presentation	80
7	Presentation of learning	80
8	Coherence and chaos of thought flow	90
9	Language Feasibility	90
10	Contextual assessment	90
Average		89

Based on the data above, it is known that the results of validation by material experts were obtained 89%, then the genetic flash flipbook media with the Improve model was very suitable for use in learning. The advice given by material experts was that it needs to add some picture illustrations related to epigenetic material.

Table 2 The Validation Result of Media Expert

No	Kriteria Kelayakan	%
1	Display	96,43
2	Ease of operation	100
3	Consistency	100
4	Form	100
5	Organization	100
6	Usefulness	100
7	Effectiveness	100
8	Learning Activities	100
	Average	99,55

Based on the data above, it is known that the results of validation by media experts obtained an average of 99.55%. Consequently, the genetic flash flipbook media with the Improve model was very suitable for use in learning. The media expert validator advised to reduce the enlarged font because it was too small, the background color too brighter so it needed to match the color. From the two validators of the genetic flash flipbook media with the Improve model, it can be concluded an average of 94.28%. Consequently, the genetic flip flash book media with the Improve model was very valid. Flipbook was one type of classic animation made from a stack of paper that resembles a thick book, on each page, a process was described something that later the process looks moving or animated. In addition to the development of the media will also be combined with the use of learning models. Learning media has become one of the influential components in the success of the learning process [14]. Flipbook media as the ebook has several advantages including: can present learning material in the form of words, sentences and images can be equipped with colors so that it attracts students' attention more [15]. The technology development of digital books can drive the integration between printed and computerized technologies during the learning process [16].

The one theory that supports the Improve learning model was the metacognition theory. Metacognition was the main element in the application of Improve learning models. That because metacognition was the most important part of the order of the Improve learning model and that distinguishes it from other similar models. The success of someone in solving problems, among others, depends on the awareness of what they know and how he did it. Metacognition was a theory related to self-recognition and how he controls and adjusts the behavior. Children need to be aware of their strengths and weaknesses. Activities in the improve learning model emphasize that students can discuss with their groups in finding concepts, finding solutions to problem-solving for the success of their groups [13].

IV. CONCLUSION

The results showed that the validity by the material experts was very valid criteria with the percentage 89%, the results of the validity by the media experts were very valid criteria with the percentage of learning media by 88.25%. The advantage of this media was more easy to use and attractive. The lack of media still needs to be developed even better. Suggestions in this study were as follows. Flash flip book media need to develop in other subjects. Based on the results of this study, other similar studies should continue to be developed with variations in the model and the media used.

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CG and CEG Distributions with Uniform Secondary Distribution

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Abstract Compound geometric (CG) and Compound extended geometric (CEG) distributions with uniform distribution on $\{0, 1, \dots, n - 1\}$ as secondary distribution are discussed. Probabilities are evaluated numerically using Fast Fourier Transform (FFT) technique. A characterization of CG distribution is established for $n = 2$. Some distributional, statistical and reliability properties of CG and CEG distributions are discussed. Parameters are estimated using Moment and BHHJ methods. The distributions are fitted using real life data sets.

Keywords: Akaike/ Bayesian information criterion(AIC,BIC), CEG distribution, CG distribution, IFR/DFR distributions, Moment/BHHJ method of estimation, New worse than used (NWU), R function, S function.

1. Introduction

Geometric compounds have been discussed extensively in the literature and have many useful applications in area of applied probability including reliability, queueing theory and risk theory. Asymptotic formulae have been derived for compound distributions when the primary distribution is of a particular type. Sundt (1982) considered geometric distribution as the primary distribution. These results were generalized by Milidiu (1985) to the compound negative binomial distribution and by Embrechts et al.(1985) to a general family of compound distributions. Willmot (1989) examined the limiting tail behavior of some discrete compound distributions including CG distribution which have been found to be useful in insurance claim modeling. It is well-known that a CG distribution converges to an exponential distribution as the geometric parameter $p \rightarrow 0$. Explicit bounds in exponential approximation for CG distribution have been given by Brown (1990,2015), Bon (2006) and Pekoz and Ollin (2011). Brown's work takes advantage of reliability properties of such CG distribution. The bounds given by Pekoz and Ollin (2011) apply more generally than to CG distributions, relaxing the assumptions that the primary distribution is geometric and the secondary random variables are independent. Pekoz et al. (2013) give bounds in the geometric approximation of CG distributions. Some of the above mentioned bounds apply in the case where the geometric distribution is on $\{0, 1, 2, \dots\}$ and some in the case where it is on $\{1, 2, 3, \dots\}$. Steutel and Van Harn (2004), discuss compound geometric distribution as part of discussing infinitely divisible (id) distributions. They prove that CG distribution on \mathbb{Z}_+ is infinitely divisible and hence compound Poisson. Sandhya and Latha (2019) introduced CEG distribution with discrete secondary distribution. It is shown that the distribution is id. A characterization of the distribution is done using its S- function, a generating function.

Reliability studies of probability distributions are mainly concerned with the concepts of hazard and reverse hazard functions. A useful tool for reducing the range of possible candidates for fitting a distribution to observed data is provided by the shape and monotonicity of the failure rate (hazard rate) function. Let X be discrete random variable with support $\{0, 1, 2, \dots\}$ or a subset thereof. Suppose $p(x) = P(X = x)$, $F(x) = P(X \leq x) = \sum_{j=0}^x p(j)$ and $R(x) = P(X \geq x) = \sum_{j=x}^{\infty} p(j)$ denote, respectively, the probability mass function (pmf), distribution function and reliability (survival) function of X . Then the hazard rate denoted by $h(x)$ is

$$h(x) = \frac{p(x)}{R(x)}, \quad x = 1, 2, \dots \quad (1.1)$$

Reverse hazard rate denoted by $H(x)$ is the probability that a component will fail at time $X = x$, given that it is known to have failed before x , where X represents the lifetime of the component. i.e,

$$H(x) = \frac{p(x)}{F(x)}, \quad x = 1, 2, \dots \tag{1.2}$$

Willmot and Cai (2001) have proved that CG distribution with DFR secondary distribution is DFR. Sandhya and Latha (2019) proved the same result in the case of CEG distribution.

Auto regressive(AR) models are based on the idea that the current value of the series can be explained as a function of previous values of the series. A sequence $\{Y_n\}$ of r.v.s describes an AR(1) scheme if there exists an innovation sequence $\{\varepsilon_n\}$ of iid r.v.s satisfying

$$Y_n = bY_{n-1} + \varepsilon_n \quad \forall n > 0,$$

integer and some $0 < b < 1$. $\{Y_n\}$ is stationary if $Y_n \stackrel{d}{=} Y_{n-1} \quad \forall n > 0$. Satheesh et.al (2006) modify this model by considering k independent AR(1) sequences $\{Y_{n,i}\}, i = 1, 2, \dots, k$ where

$$Y_{n,i} = b Y_{n-1,i} + \varepsilon_{n,i} \quad \forall n > 0, \text{ integer and } 0 < b < 1.$$

where $\{Y_{n,i}\}, i = 1, 2, \dots, k$ are identically distributed and $\{\varepsilon_{n,i}\}$ are iid. Here we consider AR(1) processes with geometric and extended geometric sum of innovations. Sample path of a stochastic process is a particular realization of the process. It is a particular set of values y_n for all values of n , generated according to the (stochastic) rules of the process. Sample paths of AR(1) models corresponding to geometric and EG sums may be drawn and their behaviour may be analyzed.

Simulation and estimation of parameters are done using both moment and BHHJ methods. BHHJ divergence based on probability generating function (pgf) is defined as

$$d_\alpha(g_r, g) = \int_0^1 [g^{1+\alpha}(t; \theta) - (1 + \frac{1}{\alpha})g_r(t)g^\alpha(t; \theta) + \frac{1}{\alpha}g_r^{1+\alpha}(t)]dt, \quad \alpha > 0 \tag{1.3}$$

where $g(t, \theta) = E_\theta(t^x), (\theta \in \Theta, \text{ the parameter space})$ is the pgf and $g_r(t) = \frac{1}{r} \sum_{i=1}^r t^{x_i}, 0 < t < 1$

is the empirical probability generating function (epgf). Parameters are estimated by minimizing equation (1.3). This optimization is done through "nloptr" package in R. Performance of estimators are measured in terms of mean squared error (MSE) to capture the precision and accuracy of estimators.

In this work, we consider discrete uniform distribution as the secondary distribution. Section 2 deals with such a geometric compound, evaluation of its probabilities and a characterization. Some of its distributional, statistical and reliability properties are discussed. In section 3, EG compound with secondary distribution as uniform is introduced and properties like distributional, statistical and reliability are discussed. AR(1) process and their sample paths with geometric and EG innovations are also discussed. Estimation of parameters using moment method and BHHJ method are done using simulated data for both the distributions. Real life data sets are analyzed and the distributions are found to fit the data sets.

2. CG Distribution with Uniform Secondary Distribution

The discrete uniform distribution is a non- parametric, symmetric distribution whereby a finite number of values are equally likely to be observed; every one of n values has equal probability $\frac{1}{n}$. Here we consider the distribution with support $\{0, 1, 2, \dots, n-1\}$. It has *mean* = $\frac{n-1}{2}$, *variance* = $\frac{n^2-1}{12}$ and $\mu_3 = 0$ (symmetric). This distribution is log-concave and IFR but not infinitely divisible.

2.1 Distributional Properties

We consider geometric distribution on $\{0, 1, 2, \dots\}$ having pgf given by

$$Q_N(t) = \frac{p}{1-qt}, \quad 0 < p < 1, p+q=1$$

and denoted by $\text{Geo}(p)$. Let X_1, X_2, \dots be the independent and identically distributed (iid) uniform random variables with

pgf $Q(t)$, $Y = \sum_{i=1}^N X_i$, the compound random variable, then

$$Q_Y(t) = \frac{p}{1 - q Q(t)} = \frac{p}{1 - \frac{q(1-t^n)}{n(1-t)}} \tag{2.1.1}$$

is the pgf of CG uniform distribution and we write $Y \sim CGU(p, n)$.

Geometric distribution is a member of Panjer's (1981) family of distributions and hence recursive formulae are available for finding the CGU probabilities. FFT technique is another method of evaluating compound probabilities. Compared to the Panjer recursion, FFT has the main advantage that it works with arbitrary frequency distribution and it is much more efficient. Though expressions for compound probabilities are available in the literature (Johnson et.al (2005)) in the context of stopped sum distributions, numerical evaluation of probabilities is not seen anywhere. Here we derive a general expression for the CGU probabilities using the pgf $Q_Y(t)$ and evaluate the probabilities numerically using FFT technique.

If

$$g_i = P[Y = i], \quad i = 0, 1, 2, \dots$$

denote the CGU probabilities, they are obtained from the pgf $Q_Y(t)$ using the formula

$$g_r = \frac{1}{r!} \left[\frac{d^r}{dt^r} \right]_{t=0} Q_Y(t), \quad r = 1, 2, \dots \text{ with } g_0 = Q_Y(0)$$

Now

$$Q_Y(t) = \frac{p}{1 - \frac{q(1-t^n)}{n(1-t)}} = p \left[1 - \frac{q}{n} (1 + t + t^2 + \dots + t^{n-1}) \right]^{-1}$$

Thus the CGU probabilities are given by

$$g_0 = p \left[1 - \frac{q}{n} \right]^{-1}$$

$$g_r = p \left(\frac{q}{n} \right)^{\left[\frac{r-1}{2} \right] + 1} \sum_{i=0}^{\left[\frac{r}{2} \right]} \binom{r-i}{i} \left(\frac{q}{n} \right)^{\left[\frac{r}{2} \right] - i} \left(1 - \frac{q}{n} \right)^{-(r-i+1)} \text{ for } r = 1, 2, 3, \dots \tag{2.1.2}$$

Here $\left[\frac{r}{2} \right]$ denotes the integer part of $\frac{r}{2}$

$$\begin{aligned} \text{Then } g_1 &= p \left(\frac{q}{n} \right) \left(1 - \frac{q}{n} \right)^{-2} \\ g_2 &= p \left(\frac{q}{n} \right) \left[\left(\frac{q}{n} \right) \left(1 - \frac{q}{n} \right)^{-3} + \left(1 - \frac{q}{n} \right)^{-2} \right] \\ g_3 &= p \left(\frac{q}{n} \right)^2 \left[\left(\frac{q}{n} \right) \left(1 - \frac{q}{n} \right)^{-4} + 2 \left(1 - \frac{q}{n} \right)^{-3} \right] \\ g_4 &= p \left(\frac{q}{n} \right)^2 \left[\left(\frac{q}{n} \right)^2 \left(1 - \frac{q}{n} \right)^{-5} + 3 \left(\frac{q}{n} \right) \left(1 - \frac{q}{n} \right)^{-4} + \left(1 - \frac{q}{n} \right)^{-3} \right] \text{ and so on.} \end{aligned}$$

The distribution function is given by

$$G_0 = g_0$$

$$\text{and } G_r = \sum_{j=0}^r p \left(\frac{q}{n} \right)^{\left[\frac{j-1}{2} \right] + 1} \sum_{i=0}^{\left[\frac{j}{2} \right]} \binom{j-i}{i} \left(\frac{q}{n} \right)^{\left[\frac{j}{2} \right] - i} \left(1 - \frac{q}{n} \right)^{-(j-i+1)} \text{ for } r = 1, 2, 3, \dots \tag{2.1.3}$$

Using FFT technique we evaluate the CGU probabilities, following Embrechts and Frei (2009), using the following R commands.

CGU ($p, 5$)

1. $M \leftarrow 128$
2. $f \leftarrow \text{vector}(\text{length} = M)$
3. $n \leftarrow 5$
4. for (j in $1 : M$) {
 if ($j < n + 1$) $f[j] = \frac{1}{n}$ else $f[j] = 0$
 }
5. $fhat \leftarrow \text{fft}(f, \text{inverse} = \text{FALSE})$
6. $u \leftarrow \frac{p}{(1 - (q * fhat))}$
7. $g \leftarrow (1/M) * \text{fft}(u, \text{inverse} = \text{TRUE})$

The vector g contains the probability masses on $0, 1, 2, \dots, (M - 1)$ where M is a truncation point. They are numerically evaluated for different values of p , but are not included in the paper as it takes much space. The graphs are plotted below.

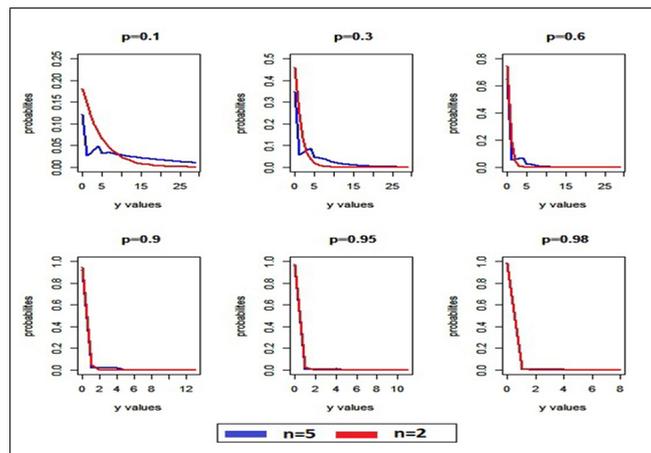


Fig 2.1.1 CGU ($p, 5$)

Remark 2.1.1 As $p \rightarrow 1$, the probability graph gets the shape of L shaped curve, irrespective of any value of n .

Remark 2.1.2 Irrespective of any value of p and n , mode of the distribution is at $Y = 0$

Moments of CGU distribution in terms of geometric and uniform parameters are given below.

$$\begin{aligned} \mu'_1(Y) &= \frac{q}{p} \left(\frac{n-1}{2} \right) \\ \mu_2(Y) &= \frac{q}{12p^2} (n-1)[3(n-1) + p(n+1)] \\ \mu_3(Y) &= \frac{q}{4p^3} (n-1)^2 [n + p - 1] \\ &> 0 \text{ always,} \end{aligned}$$

implying that CGU distribution is positively skewed.

In order to evaluate median for different values of p and n , we make use of the idea of quantiles. Quantiles are useful measures because they are less susceptible than means to long-tailed distributions. The quantile function is one way of prescribing a probability distribution and it is an alternative to the pmf and the cumulative distribution function (cdf). The discrete cdf is a step function, so it does not have an inverse function. Given a probability p_0 , the quantile for p_0 is defined as the smallest value of the random variable Y for which $F(y) \geq p_0$. The quantile corresponding to $p_0 = 0.5$ gives the median.

Closed form expression for quantiles are not easy to derive as the distribution function is not in a compact form. We have simulated sample of size 100 from CGU distribution ($p = 0.9, 0.6, 0.3, 0.1$) and the quantile values at different probabilities are tabulated below.

Table 2.1.1

	$p_0 \rightarrow$	0.1	0.3	0.5	0.7	0.9	0.99
$n = 5$	0.1	0	5	12	30	43	86
	0.3	0	0	3	6	12	26
	0.6	0	0	0	1	4	10
	0.9	0	0	0	0	0	4
$n = 2$	0.1	0	1	3	5	11	22
	0.3	0	0	1	1	3	7
	0.6	0	0	0	0	1	3
	0.9	0	0	0	0	0	1

Mean ,median and variance for different values of p and n are tabulated below.

Table 2.1.2

p	$n = 2$			$n = 5$		
	Mean	Median	Variance	Mean	Median	Variance
0.1	9/2	3	99/4	18	12	378
0.3	7/6	1	91/36	14/3	3	322/9
0.6	1/3	0	8/18	4/3	0	104/18
0.9	1/8	0	57/972	2/9	0	58/81

Remark 2.1.3 As p increases, mean and variance get decreased, median is non increasing but mode remains the same.

A characterization of CGU distribution, for $n = 2$ is stated below.

Theorem 2.1.1 A CGU (p, n) is Geo (p') where $p' = \frac{2p}{2-q}$ iff the secondary distribution is uniform with $n = 2$. i.e. on $\{0, 1\}$

Proof: Let $Y \sim CGU(p, 2)$.

$$\begin{aligned}
 \text{Then } Q_Y(t) &= \frac{p}{1 - \frac{q(1+t)}{2}} \\
 &= \frac{2p}{2 - q - qt} \\
 &= \frac{p'}{1 - q't} \text{ , where } p' = \frac{2p}{2 - q} \text{ , } q' = \frac{q}{2 - q} \text{ ,}
 \end{aligned}$$

which is the pgf of Geo (p').

On the other hand,

$$\begin{aligned}
 \text{Let } Q_Y(t) &= \frac{p'}{1 - q't} \text{ , where } p' = \frac{2p}{2 - q} \text{ , } q' = \frac{q}{2 - q} \\
 &= \frac{p}{1 - q\left(\frac{1+t}{2}\right)} \text{ , which is the pgf of CGU } (p, 2).
 \end{aligned}$$

Result 2.1.1 CGU distribution approaches to degenerate distribution at 0 as $p \rightarrow 1$, irrespective of the values of n .

Steutel and Van Harn (2004) established id property of CG distribution using the absolute monotonicity of its R- function. For CGU distribution, the R- function is given by

$$R_Y(t) = \frac{Q'_Y(t)}{Q_Y(t)}, \quad 0 \leq t < 1$$

$$= q[1 - qQ(t)]^{-1} Q'(t), \text{ which is absolutely monotone.}$$

They give a characterization of the CG distribution using generating function S of the sequence $(s_j)_{j \in \mathbb{Z}_+}$, of non negative numbers with $s_j = q q_{j+1}$, $j \in \mathbb{Z}_+$ where $Q(t) = \sum_{i=1}^{\infty} q_i t^i$.

The characterization property is stated below.

Theorem 2.1.2 Let $Q_Y(t)$ be a positive function on $0 \leq t < 1$ with $Q_Y(1-) = 1$ then $Q_Y(t)$ is a CG pgf iff its S function is absolutely monotone.

The function S in this theorem is given by

$$S_Y(t) = \frac{1}{t} \left[1 - \frac{Q_Y(0)}{Q_Y(t)} \right] \quad (0 \leq t < 1)$$

which is absolutely monotone, by its construction. Thus the class of CG distributions turns out to have many properties very similar to the class of all id distributions.

2.2 Reliability Properties

Reliability classification of compound geometric distribution has been considered by various authors such as Shanthikumar (1988), Brown (1990), Cai and Kalashnikov (2000), Willmot (2002) and so on. Szekli (1986) proved that complete monotonicity is preserved under geometric compounding. The reliability properties like DFR and NWU are not preserved under finite sums. But Shantikumar (1988) has shown that DFR property is preserved under geometric sum. i.e. if the secondary distribution is DFR then the geometric sum is also DFR. Cai and Kalashnikov (2000) prove that geometric sum is NWU. They have introduced a new class of discrete distributions as follows.

Definition 2.2.1 The discrete distribution $\{p_n, n \geq 0\}$ of a non- negative integer valued random variable M is said to be discrete new worse strongly than used (DS-NWU) if $a_{m+n+1} \geq a_m a_n$, $m, n = 0, 1, \dots$ where $a_n = \sum_{i=n+1}^{\infty} p_i$, written $M \in DS - NWU$.

They have shown that a class of random sums is NWU, if the primary distribution is DS-NWU, whatever the secondary distribution is. It is stated in the following theorem.

Theorem 2.2.1 If $M \in DS - NWU$, then the random sum $\sum_{i=1}^M X_i$ is NWU.

For geometric distribution on $\{0, 1, 2, \dots\}$,

$$a_n = q^{n+1}$$

$$a_{m+n+1} = q^{m+n+2} = a_m a_n$$

which imply that geometric distribution is DS-NWU. Hence by theorem (2.2.1), CG distribution is NWU and hence New worse than used in expectation (NWUE).

Willmot and Cai (2004) proved that residual life time of a compound geometric convolution is again a compound geometric convolution. Willmot and Cai (2001) established that if Y is CG, then Y is DS-NWU. Also if Y is DS-DFR, Y is DS-NWU.

The following diagram summarizes the relationship between some discrete reliability classes.

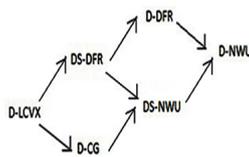


Fig 2.2.1

From (1.1) and (1.2), the hazard and reverse hazard functions are

$$h(r) = \frac{g_r}{R_r}, \text{ for } r = 1, 2, \dots$$

$$\text{and } H(r) = \frac{g_r}{G_r}, \text{ for } r = 1, 2, \dots$$

where g_r and G_r are given by (2.1.2) and (2.1.3) with $R_r = \sum_{j=r}^{\infty} g_j$.

The expressions for reverse hazard rate for CGU distribution for certain values of r are given below.

$$H_1 = H_2 = \frac{q}{n}$$

$$H_3 = \frac{\left(\frac{q}{n}\right)^2 \left[\frac{q}{n} + 2\left(1 - \frac{q}{n}\right)\right]}{\left(1 - \frac{q}{n}\right) + \left(\frac{q}{n}\right)^2 \left[2 - \frac{q}{n}\right]}$$

$$H_4 = \frac{\left(\frac{q}{n}\right)^2 \left[\left(\frac{q}{n}\right)^2 + \left(1 - \frac{q}{n}\right)\left(1 + \frac{2q}{n}\right)\right]}{\left(1 - \frac{q}{n}\right)^2 + \left(\frac{q}{n}\right)^2 \left[3 - \frac{2q}{n}\right]} \text{ and so on.}$$

Compact expression for hazard rate and reverse hazard rate are not available so their values are evaluated and plotted

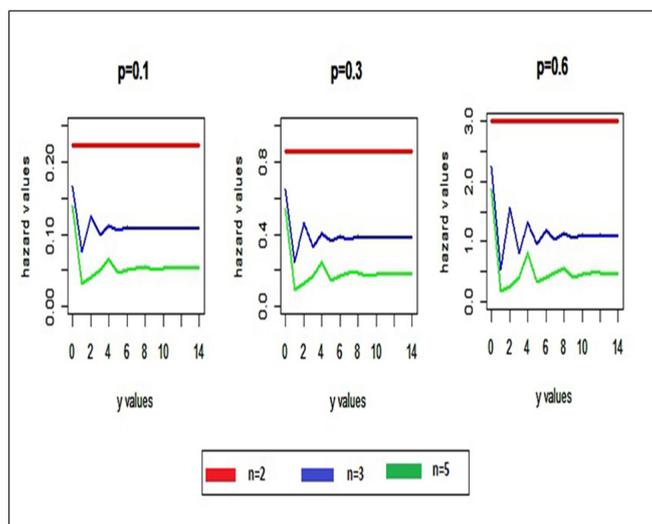


Fig 2.2.2 Hazard function graph (CGU)

Remark 2.2.1 For $n = 2$, the hazard function graph is a straight line, indicating constancy of hazard rate (this has been theoretically established by theorem 2.1.1). Also, the graph gets stabilized more rapidly for small values of p than for large values, irrespective of the value of n .

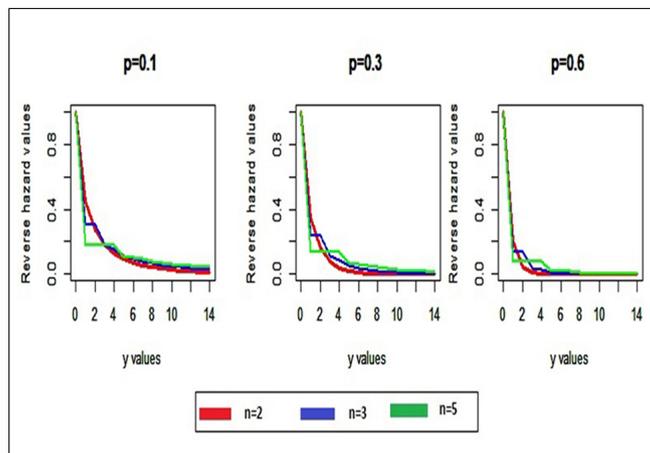


Fig 2.2.3 Reverse Hazard function graph (CGU)

Remark 2.2.2 The tail of the function becomes parallel to the X axis as p becomes higher and higher, irrespective of the value of n .

2.3 An AR(1) process corresponding to CGU distribution

Consider AR(1) process $\{Y_{n,i}\}$ with innovation sequence $\epsilon_{n,i}$ given by

$$\begin{aligned}
 Y_{n,i} &= 0 \text{ with the probability } p \\
 &= Y_{n-1,i} + \epsilon_{n,i} \text{ with probability } (1 - p)
 \end{aligned}
 \tag{2.3.1}$$

Then $Q_Y(t) = p + Q_Y(t) Q_\epsilon(t) (1 - p)$

$$\Rightarrow Q_Y(t) = \frac{p}{1 - Q_\epsilon(t)}, \text{ assuming that } Y_{n,i} \stackrel{d}{=} Y_{n-1,i} \quad \forall i$$

The following theorem characterizes CGU distribution.

Theorem 2.3.1 A sequence $\{Y_{n,i}\}$ given by (2.3.1) defines a stationary AR(1) process for some p iff it is geometric sum of innovations $\{\epsilon_{n,i}\}$.

Sample path of the AR(1) process defined by (2.3.1) is displayed below for simulated data, for different values of p and n , by assuming CGU for $\{\epsilon_{n,i}\}$.

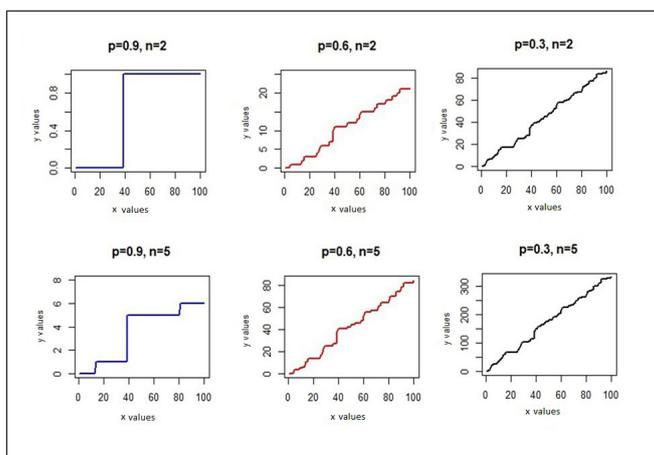


Fig 2.3.1 Sample Path of AR(1) Process of CGU (p,n)

Remark 2.3.1 As $p \rightarrow 1$, the sample path gets the shape of a step function. The no. of steps is getting increased for increased values of n .

2.4 Simulation and Estimation

As uniform distribution is nonparametric, CGU distribution has only one parameter. Maximum likelihood estimation (mle) method cannot be used as the pmf has no compact form. So they are estimated using (1) Moment estimation method and (2) BHHJ method.

Let m_1 denote the sample mean. Moment estimator of p is obtained by solving the following equation.

$$2pm_1 - q(n - 1) = 0 \tag{2.4.1}$$

For known values of n , the parameter p is estimated using (2.4.1). BHHJ estimate is obtained by minimizing equation (1.3) using "nloptr" package in R.

Table 2.4.1
 Estimates using simulated sample of size 100 , no. of replications 50 .

$n = 5$			
p		Moment	BHHJ
0.2	Estimate	0.203735	0.202942
	Mean bias	0.003735	0.002942
	MSE	0.000356	0.000684
0.5	Estimate	0.507468	0.501737
	Mean bias	0.007468	0.001737
	MSE	0.001587	0.001785
0.8	Estimate	0.808023	0.807485
	Mean bias	0.008023	0.007485
	MSE	0.001635	0.001540

2.5 Fitting of CGU using Real Life Data Set

Thalassemia is a genetic blood disorder in which the body makes an abnormal form of hemoglobin, the protein in red blood cells that carries oxygen. A study was conducted by Zafakali (2013) involving a sample of 930 for children age between 1-12 years. To build this data set, the numbers of diagnoses among children aged 1-12 years who suffer from Thalassemia were counted. The data were collected at the Medical Record Unit in Hospital Universiti Sains Malaysia (HUSM), Kubang Kerian, Kelantan in north-east Malaysia 2005 to 2010. In the data set, there were 930 patients and among these, 635 patients had no diagnosis; thus, there are 68 zero counts in the data. Frequency (percent) of patients who received a different type of diagnosis is a total of 125 (13.4 percentage), while patients who received two different types of diagnosis was 95 (10.2 percentage). For patients who received three different types of diagnosis the frequency (percent) was 58 (6.2 percentage) and patients who received four different types of diagnosis was 17 (1.8 percentage). The fitting is done using chi- square test of goodness of fit. Here both AIC and BIC methods cannot be applied here because of the complexity of pmf.

Table 2.5.1

Type of diagonosis	Obs. freq.	Exp. freq. (pooled)
0	68.3	72.772279
1	13.4	9.907116
2	10.2	11.255857
3	6.2	6.064743
4	1.8	
<i>Total</i>	100	100
<i>d.f</i>		2
<i>Chi value</i>		2.288363
<i>p value</i>		0.3184845

The parameter p is estimated using moment method for $n = 3$ and we get $p^\Lambda = 0.5621801$ The p value shows that CGU distribution provides a good fit for the data.

The probability graphs corresponding to observed and theoretical frequencies are displayed below.

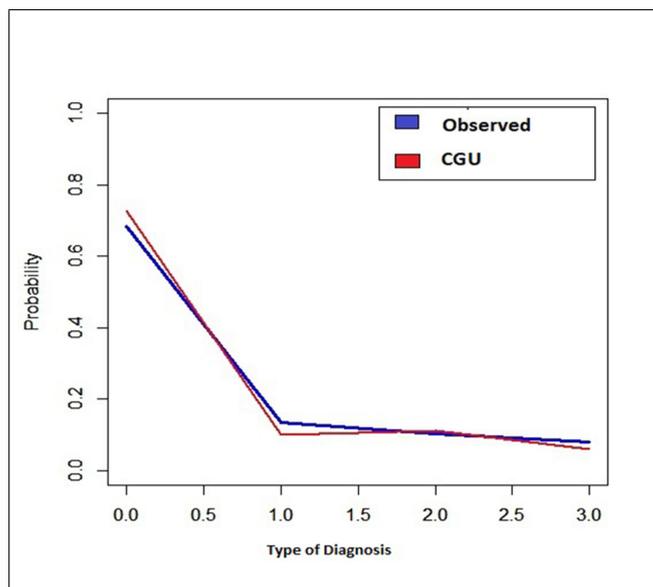


Fig 2.5.1

3. CEG Distribution with Uniform Secondary Distribution

3.1 Distributional Properties

The probability distribution having pgf given by

$$Q_N(t) = \frac{p}{1 - q t^k}, \quad k > 0 \text{ integer}, 0 < p < 1, p + q = 1$$

is called extended geometric (EG) distribution on $\{0, k, 2k, \dots\}$. Putting $k = 1$, it reduces to geometric distribution.

Let X_1, X_2, \dots be the independent and identically distributed (iid) uniform random variable with pgf $Q(t)$, $Y = \sum_{i=1}^N X_i$ the compound random variable, then

$$Q_Y(t) = \frac{p}{1 - q [Q(t)]^k} \tag{3.1.1}$$

where $Q(t) = \frac{1-t^n}{n(1-t)}$, $0 < t < 1$, is the pgf of CEG uniform distribution and we write $Y \sim CEGU(k, p, n)$. Putting $k = 1$ this distribution reduces to CGU distribution.

From $Q_Y(t)$, CEGU probabilities are given by

$$g_0 = p [1 - q n^{-k}]^{-1}$$

$$g_1 = k p q n^{-k} [1 - q n^{-k}]^{-2}$$

$$g_2 = \frac{k p q n^{-k}}{2} \left[k q n^{-k} (1 - q n^{-k})^{-3} + \left(\frac{k+1}{2}\right) (1 - q n^{-k})^{-2} \right] \text{ and so on.}$$

Its not easy to have a general formula for the pmf of CEGU distribution. The probabilities can be evaluated numerically, using FFT, with the following R- commands. They are also plotted for different values of p .

CEGU ($k, p, 5$)

1. $M \leftarrow 128$
2. $k \leftarrow 2$
3. $f \leftarrow \text{vector}(\text{length} = M)$
4. $n \leftarrow 5$
5. for (j in $1 : M$) {
 if ($j < n + 1$) $f[j] = \frac{1}{n}$ else $f[j] = 0$
 }
6. $fhat \leftarrow \text{fft}(f, \text{inverse} = \text{FALSE})$
7. $fkhat \leftarrow fhat * fhat$
8. $u \leftarrow \frac{p}{(1 - (q * fkhat))}$
9. $g \leftarrow (1/M) * \text{fft}(u, \text{inverse} = \text{TRUE})$

The vector g contains the probability masses on $0, 1, 2, \dots, (M - 1)$ where M is a truncation point. The probabilities are evaluated using FFT technique (following Embrechts and Frei(2009)) for specific values of p, k and n . They are not displayed here as it takes much space. Graphs are given below.

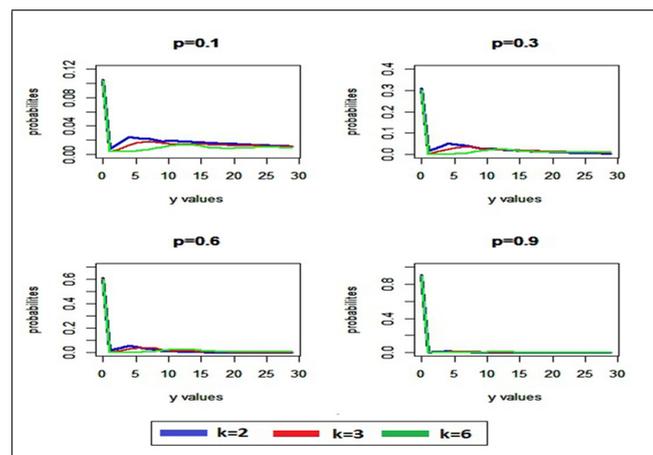


Fig 3.1.1 CEGU ($k, p, 5$)

It is observed from the graph that, change in the value of k does not affect the shape (L shape) of the probability graph for values of p approaching 1.

Moments of CEGU are given by

$$\begin{aligned} \mu'_1(Y) &= \frac{kq}{p} \left(\frac{n-1}{2} \right) \\ \mu_2(Y) &= \frac{kq}{12p^2} (n-1) [3k(n-1) + p(n+1)] \\ \mu_3(Y) &= \frac{k^2q(n-1)^2}{8p^3} [k(n-1)(1+q) + p(n+1)] \\ &> 0 \text{ always,} \end{aligned}$$

implying that CEGU distribution is positively skewed.

Irrespective of any value of k,p and n mode of the distribution is at $Y = 0$.

In order to evaluate median for different values of p and n, we make use of the idea of quantiles. Closed form expression for quantiles are not easy to derive as the distribution function is not in a compact form. We have simulated a simulated sample of size 100 from CEGU distribution ($p = 0.9, 0.6, 0.3, 0.1$) and the quantile values at different probabilities are tabulated below.

Table 3.1.1 ($k = 2$)

	p_0	0.1	0.3	0.5	0.7	0.9	0.99
$n = 5$	0.1	0	11	23	41	76	118
	0.3	0	0	6	12	24	51
	0.6	0	0	0	3	8	20
	0.9	0	0	0	0	0	7
$n = 2$	0.1	0	3	6	11	22	44
	0.3	0	0	1	3	6	13
	0.6	0	0	0	1	2	5
	0.9	0	0	0	0	0	2

Mean ,median and variance for $k = 2, 3$ and for different values of p and n are tabulated below.

Table 3.1.2

p	$p = 0.1$		$p = 0.3$		$p = 0.6$		$p = 0.9$		
	$k = 2$	$k = 3$							
$n = 2$	Mean	9	27/2	7/3	7/2	2/3	1	1/9	1/6
	Median	6	9	1	2	0	0	0	0
	Variance	27/2	837/4	7/2	77/4	1	12	1/6	13/36
$n = 5$	Mean	36	54	28/3	14	8/3	4	4/9	2/3
	Median	23	31	6	8	0	0	0	0
	Variance	180	3294	140/3	294	40/3	44	20/9	46/9

Remark 3.1.1 Irrespective of the value of k, as p increases, mean and variance get decreased, median is non increasing but mode remains the same.

Result 3.1.1 CEGU distribution approaches to degenerate distribution at 0 as $p \rightarrow 1$, irrespective of the values of n.

Following Steutel and Van Harn (2004), Sandhya and Latha (2019) establish that CEG distribution with any secondary distribution is id using the absolute monotonicity of its R-function. Hence CEGU is also id. Another generating function $S_Y(t)$ introduced by Steutel and Van Harn (2004) also leads to a characterization for CEG distribution. In this connection Sandhya and Latha (2019) state the following theorem.

Theorem 3.1.1 A distribution is CEG iff its S function given by

$$S_Y(t) = \frac{1}{t} \left[1 - \frac{Q_Y(0)}{Q_Y(t)} \right]^{\frac{1}{k}}$$

is absolutely monotone.

3.2 Reliability Properties

We define DS-NWU property for distributions having support with gap , say, k as follows.

Definition 3.2.1 The discrete distribution $\{p_{nk}, (n \geq 0 \text{ and } k > 0, \text{ integer})\}$ of a non- negative integer valued random variable M is said to be DS-NWU if $a_{(m+n+1)k} \geq a_{mk}a_{nk}, m, n = 0, 1, \dots$ where $a_{nk} = \sum_{i=(n+1)k}^{\infty} p_{ik}$, written $M \in DS - NWU$.

For CEG distribution, $p_{ik} = pq^i, i = 0, 1, 2, \dots, a_{mk} = \sum_{i=(m+1)k}^{\infty} p_{ik} = q^{m+1}$ and $a_{(m+n+1)k} = q^{(m+n+2)} = a_{mk}a_{nk}$ which implies that the distribution is DS-NWU. By theorem (2.1.1), CEG is NWU and hence NWUE.

Sandhya and Latha (2019) have proved that CEG distribution with DFR secondary distribution is DFR. But the IFR property of secondary distribution is not preserved, in general, under compounding. Sandhya and Latha (2019) have illustrated this in the case of CEG distribution with an IFR secondary distribution. Here we illustrate the same result using uniform secondary distribution which is an IFR distribution.

For CEGU (k, p, n),

$$\frac{g_2}{g_1} - \frac{g_1}{g_0} = \frac{k+1}{2} \geq 0 \text{ always.}$$

$$\Rightarrow \frac{g_2}{g_1} > \frac{g_1}{g_0}$$

$$\Rightarrow \frac{g_1}{g_0} > \frac{g_2}{g_1}$$

implying that CEGU is not IFR.

Since the hazard and reverse hazard functions of CEGU have no closed form, they are evaluated using (1.1) and (1.2). Graphs are plotted below for different values of p and n, and k.

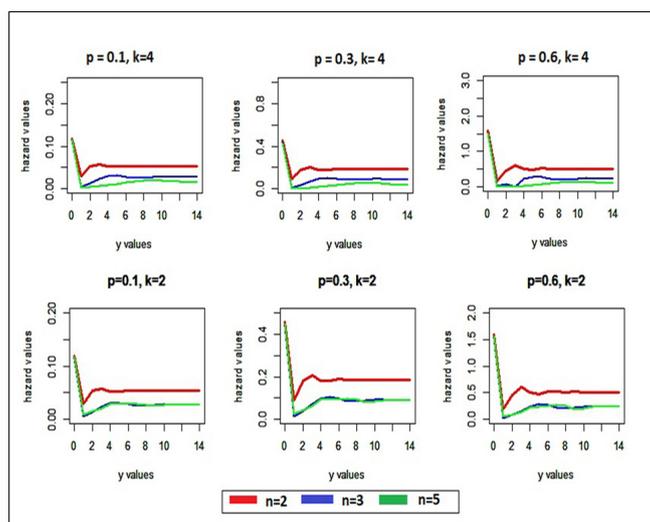


Fig 3.2.1 Hazard function graph (CEGU)

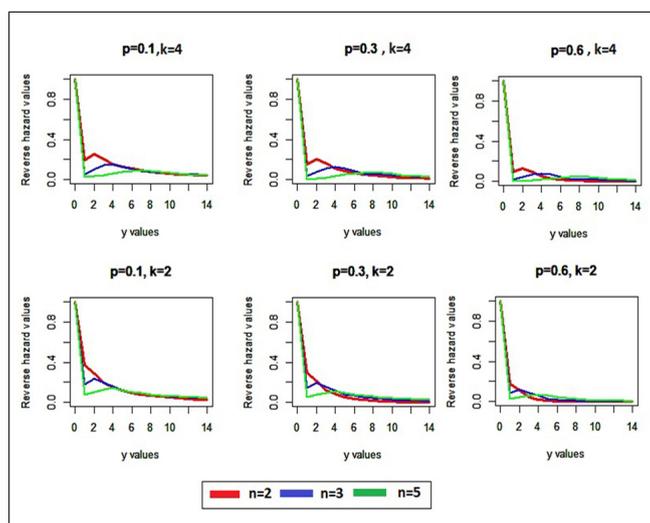


Fig 3.2.2 Reverse Hazard function graph (CEGU)

Remark 3.2.1 Variation in n becomes noticeable in the graph as k increases, for both hazard and reverse hazard rates. Constancy of hazard rate can be observed for $n = 2$ on the right tail of the distribution.

3.3 An AR(1) process corresponding to CEGU distribution

Sandhya and Latha (2019) defined a stationary AR(1) process with EG sum of innovations as below.

Consider AR(1) process $\{Y_{n,i}\}$ with innovation sequence $\{\varepsilon_{n,i}\}$ given by

$$Y_{n,i} = 0 \text{ with the probability } p$$

$$= Y_{n-1,i} + \sum_{i=1}^k \varepsilon_{n,i} \text{ with probability } (1 - p) \tag{3.3.1}$$

Then $Q_Y(t) = p + Q_Y(t) [Q_\varepsilon(t)]^k (1 - p)$

$\Rightarrow Q_Y(t) = \frac{p}{1 - q [Q_\varepsilon(t)]^k}$, assuming that $Y_{n,i} \stackrel{d}{=} Y_{n-1,i} \forall i$

Theorem 3.3.1 A sequence $\{Y_{n,i}\}$ given by (3.3.1) defines a stationary AR(1) process for some p iff it is extended geometric sum of innovations $\{\varepsilon_{n,i}\}$.

Sample path of the AR(1) process defined by (3.3.1) is displayed below for simulated data, for different values of p and n by assuming CEGU for $\{\varepsilon_{n,i}\}$

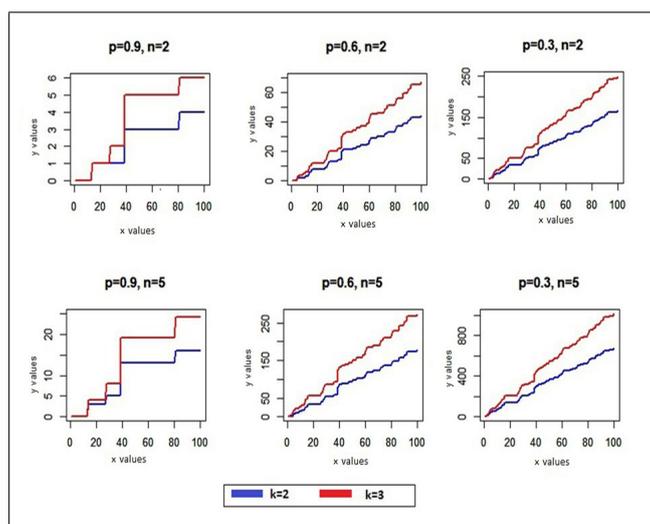


Fig 3.3.1 Sample Path of AR(1) Process of CEGU (k,p,n)

Remark 3.3.1 As in the case of CGU distribution, the sample path of CEGU AR(1) process is a step function for values of p approaching 1. Variation in k does not affect the shape of the sample path but it affects the height of the jumps.

3.4 Simulation and Estimation

As uniform distribution is nonparametric, CEGU distribution has only two parameters. Maximum likelihood estimation (mle) method cannot be used as the pmf has no compact form. So they are estimated using (1) Moment estimation method and (2) BHHJ method.

Moment estimation

Let m_1, m_2 denote the sample raw moments. Moment estimators of k and p are obtained by solving the following equations using 'nleqslv' package in R. The equations and estimates for different values of p are given below.

$$2pm_1 - kq(n - 1) = 0 \tag{3.4.1}$$

$$12p^2m_2 - 3k^2q(n - 1)^2(1 + q) - kpq(n^2 - 1) = 0 \tag{3.4.2}$$

Case 1: When p is unknown.

For known values of n , the parameter p is estimated using (3.4.1)

Table 3.4.1
 Moment estimates using simulated sample of size 100 , no. of replications 50 .

$n = 5$			
p		$k=2$	$k=3$
0.2	Estimate	0.204632	0.210882
	Mean bias	0.004632	0.010882
	MSE	0.000334	0.000411
0.5	Estimate	0.506512	0.506507
	Mean bias	0.006512	0.006507
	MSE	0.001388	0.001320
0.8	Estimate	0.806847	0.803091
	Mean bias	0.006847	0.006563
	MSE	0.001430	0.001325

Case 2: When two parameters are unknown.

For known values of n , CEG distribution has two unknown parameters and are obtained by solving equations (3.4.1) and (3.4.2) using nleqslv package in R.

Table 3.4.2
 Moment estimates using simulated sample of size 100 and no. of replications 10 ($n = 5$).

p		$k = 2$		$k = 3$	
		p^\wedge	k^\wedge	p^\wedge	k^\wedge
0.2	Mean estimate	0.241371	2.607611	0.147864	2.404951
	Mean bias	-0.041371	-0.607612	0.052135	0.059504
	MSE	0.007387	1.571391	0.011350	1.014295
0.5	Mean estimate	0.590976	2.755884	0.556360	3.363823
	Mean bias	-0.090976	-0.755884	-0.056360	-0.363823
	MSE	0.012602	1.034691	0.007078	0.723615
0.8	Mean estimate	0.854548	2.829627	0.848387	3.507484
	Mean bias	-0.054548	-0.829627	-0.048358	-0.507484
	MSE	0.004188	0.52796	0.003344	1.101041

BHHJ estimation

BHHJ estimates are obtained by minimizing equation (1.3) using "nloptr" package in R.

Case 1: When p is unknown.

Table 3.4.3
 BHHJ estimates using simulated sample of size 100 , no. of replications 50 .

p		0.2	0.5	0.8	
$n = 5$	k=2	Estimate	0.203416	0.502162	0.804255
		Mean bias	0.003416	0.002162	0.004255
		MSE	0.000690	0.001485	0.001444
k=3		Estimate	0.204370	0.503696	0.803091
		Mean bias	0.004370	0.003696	0.003912
		MSE	0.000778	0.001498	0.001351

Case 2: When two parameters are unknown.

Table 3.4.4
 BHHJ estimates using simulated sample of size 100 and no. of replications 20 ($n = 5$).

p		$k = 2$		$k = 3$	
		k^{\wedge}	p^{\wedge}	k^{\wedge}	p^{\wedge}
0.2	Mean estimate	2.1944230	0.2205859	3.1317359	0.2128203
	Mean bias	-0.1944230	-0.0205859	-0.1317359	-0.0128203
	MSE	0.1705347	0.0018693	0.3234513	0.0020037
0.5	Mean estimate	2.1259131	0.5207505	2.9856644	0.4975384
	Mean bias	-0.1259131	-0.0207505	0.0143355	0.0024615
	MSE	0.0158541	0.0026717	0.2218073	0.0017699
0.8	Mean estimate	1.9962663	0.7845363	2.9037136	0.7913346
	Mean bias	0.0037336	0.0154363	0.0962863	0.0086653
	MSE	0.1004599	0.0013723	0.1273030	0.0015122

3.5 Fitting of CEGU using Real Life Data Set

Ridout et.al (2001) give the no. of roots produced by micro- propagated shoots of the columnar apple cultivar Trajan. The roots had been produced under an 8- h or 16-h photoperiod in culture systems that utilized one of four different concentrations of the cytokinin in BAP culture medium. Let Group I (Gr I) consist of the data produced under 8 hour period and Group II (Gr II) consist of the data produced under 16 hour photoperiod.

Table 3.5.1

Number of roots	Obs. fr. (GrI)	Obs. fr. (GrII)
0	2	62
1	3	7
2	6	7
3	7	8
4	13	8
5	12	6
6	14	10
7	17	4
8	21	2
9	14	7
10	13	4
11	10	2
12	2	3
13	2	0
14	3	0
15	0	0
16	0	0
17	1	0
Total	140	130

Here we analyze data with observed frequencies of Group II. The parameters k and p are estimated using moment method and are given by $p^{\wedge} = 0.43$ and $k^{\wedge} \simeq 2$ for $n = 3$. The model is fitted using chi square test and the details are given below.

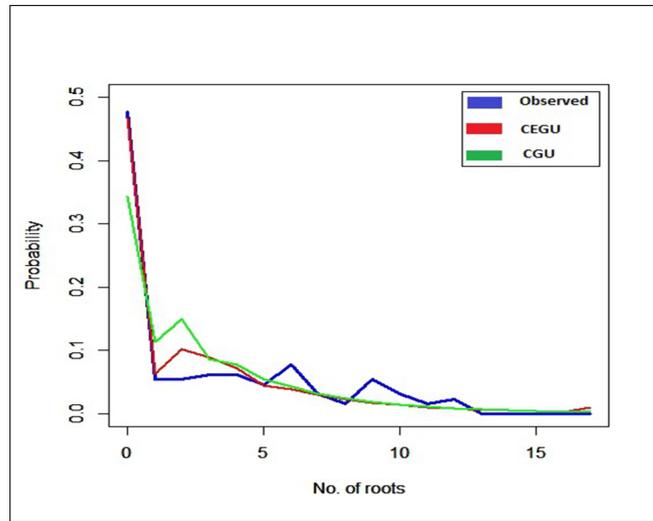


Fig 3.5.1

Table 3.5.2

<i>Obs. fr. (GrII)</i>	<i>Expected frequency. (CEGU)</i>	<i>Expected frequency. (CGU)</i>
62	60.708724	44.708988
7	8.089586	14.666441
7	13.212336	19.477655
8	11.467098	11.2007101
8	9.291633	10.063803
6	5.829716	6.975661
10	5.042330	5.589666
4	3.839281	4.121959
2	2.915338	3.185824
7	2.216181	2.397262
4	1.725570	1.831489
2	1.317176	1.387209
3	1.009971	1.055869
0	0.775449	0.801433
0	0.595687	0.609274
0	0.456712	0.462771
0	0.350544	0.351676
0	1.15664	1.112273
<i>Total</i>	130	130
<i>d.f</i>	6	7
<i>Chi square value</i>	10.54589	28.97532
<i>p value</i>	0.103466	0.0001461

The p values show that CGU is not fit for the data whereas CEGU provides a good fit.

Conclusion

Compounding changes so many aspects of the basic distribution. From a distribution, which is symmetric, we get a positively skewed distribution, a distribution which has no mode, to a distribution with a fixed mode at 0, from a distribution with finite support to a distribution with infinite support. At the same time, the calculation of probabilities become tedious due to compounding. The CGU and CEGU probability functions behave alike, approaching to degenerate distribution at 0, as $p \rightarrow 1$. The IFR property of uniform distribution is not preserved under both geometric and EG compounding.

Observing the hazard rate values of the CGU and CEGU distributions, it can be inferred that both distributions are not IFR/DFR in general. For $n = 2$, CGU distribution shows constant hazard rate. Thus by compounding a constant failure rate distribution with an IFR distribution, we get a constant failure rate distribution. For higher values of p , for different values of k , the sample path is a step function. The significance of the gap k is evident from the real life data set given by Ridout et.al (2001). CGU distribution is not fit for the data, but CEGU provides a good fit.

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Influence of Organizational factors on the Job Satisfaction of the Apparel Sector Employees in Anuradhapura district

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Abstract: *The purpose of this study was to investigate the Influence of Organizational factors on the Job Satisfaction of the Apparel Sector Employees in Anuradhapura district. Organizational factors were considered as the independent variable and the Job Satisfaction of the Apparel Sector Employees in Anuradhapura district was considered as the dependent variable. Researcher used five organizational factors as the independent variables. The sample was 100 which selected from an apparel factory in Anuradhapura district for the study. A questionnaire was used to collect the data from the employees. Respondents were asked to indicate their agreement or disagreement on Five Point likert Scale as the scaling method. The measurement scale for independent and dependent variables were "interval". The data was analyzed using Statistical Package for Social Sciences (SPSS) version 21.0. Mean Score and Standard Deviation were used for all the variables for univariate analysis and correlation coefficient was used for bivariate analysis. The hypotheses were tested using the Correlation and regression analysis. The results indicated that the job satisfaction of the employees was in moderate level. The influence of organizational factors on job satisfaction on of the employees have not been changed according to the gender, age or category of employee. The results of correlation analysis illustrated that the organizational factors are positively and significantly correlated with the job satisfaction of the employees. A weak positive and significant relationship was found between all the factors except promotional opportunities.*

Key words; organizational factors, job satisfaction, employees, apparel sector

01. Introduction

For almost all organizations, employees are the vital resource and they represent an important asset of an industry. Highly performing individuals will be able to assist organization to achieve its strategic aims thus sustaining the organization competitive advantage (Dessler, 2010). Human resource management is concerned with developing potential of employees so that they get maximum job satisfaction from their work and give their best efforts to the organization. Therefore, human resource managers in the apparel sector attempt to hire and retain satisfied employees. The managers are aware of the role of job satisfaction for the improvement of job performance of the organization.

Job satisfaction can be perceived as how an individual is comfortable with his or her job (Alauddin, Ahsan, & Hossain, 2019). Employee attitude is based on the job satisfaction. Job satisfaction is contentment occurs out of the employee's positive and negative feelings toward his or her work. It represents one of the most critical areas where managers are facing challenges while managing their employees. If workers do not feel better with their jobs, there performances are overblown and their behavior may also affect other workers.

Job satisfaction benefits the organizations includes reduction in complaints and grievances, absenteeism, turnover and termination; as well as improved punctuality and worker moral. Job satisfaction and occupational success are major factors in personal satisfaction, self-respect, self-esteem, and self-development. This industry holds number one position in our economy. As this industry plays an important role in generating employment opportunity, a regular monitoring of employee's job satisfaction is essential for the smooth conduct of operation. There are many factors which influence job satisfaction (Vani & Janani, 2016). The major factors influences or causes of job satisfaction are

- Organizational factors
- Group Factors

- Individual factors.

As employees are the back bone of every organization, no work can be done without employees. If the attitude of employee towards his or her job is positive, there is job satisfaction or negative there exist job dissatisfaction. A positive satisfaction gives less work stress, cheerful and positive approach, whereas job dissatisfaction gives dejection, disappointment or even depression. But if an employee approaches the problem with more confident and positive, he can be satisfied and succeed easily. So that having a positive job satisfaction is much more important because otherwise it will lead to occur some serious problems to an organization. Today, the Sri Lankan apparel industry is confronted with a serious problem. Factory employees do not stay in one organization in the long term. Reasons are attributed to the cost of living which increases time to time due to the global economic situation and employees demand higher salaries (Fernando, Selvam, & Bennet, 2010). So that it is clear a proper satisfaction level is very much needed for employees with the existing economy level for apparel sector employees. Through this research a study is done in order to find out the impact of organizational factors to the job satisfaction of apparel sector employees in Anuradhapura district.

Research questions

1. What are the organizational factors influencing on job satisfaction of apparel sector employees?
2. What is the impact of each individual factor on job satisfaction of apparel sector employees?
3. Which factor influences mostly on job satisfaction of apparel sector employees?

Research Objectives

1. To identify the organizational factors influencing on job satisfaction of apparel sector employees.
2. To investigate the impact of each individual factor on job satisfaction of apparel sector employees.
3. To examine the factor influences mostly on job satisfaction of apparel sector employees.

02. Literature Review

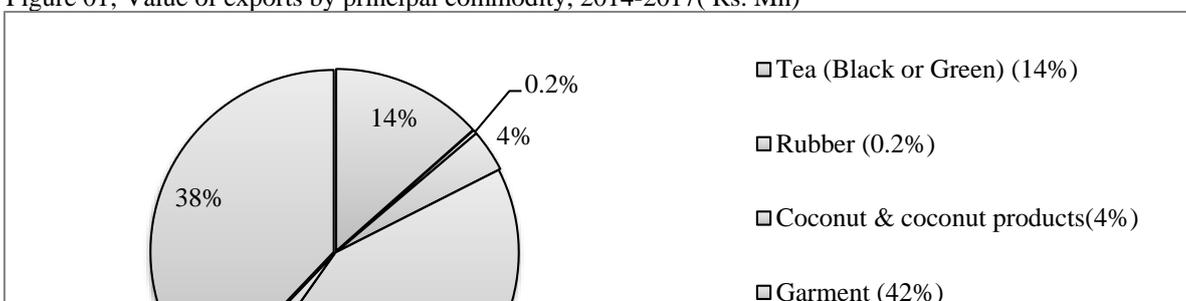
Apparel industry is a sector that manufactures semi-durable consumer goods to fulfill the basic clothing needs of individuals (Istanbul Chamber of Industry, 2012). Apparel industry produces all kinds of cloths and accessories. Garment consumption is not just for fulfilling the needs of individuals, but also for satisfying their tastes and preferences and offering them the style and status they are looking for. Apparel industry is composed of clothing that includes outerwear, underwear, work and leather clothes, knitted and fur clothes.

Sri Lanka Exports Development Board (2013) also stated that Sri Lanka’s Apparel Export Industry is the most significant and dynamic contribution towards the country’s economy. The industry has demonstrated the tremendous growth over the past four decades and has today become the country’s primary foreign exchange earner amounting to 40% of the total exports and 52% of industrial exports. The industry, which is entirely privately owned, has successfully exploited the opportunities in the international market. The apparel industry is the largest single employer in the manufacturing industry providing direct employment opportunities to approximately 300000 and indirect employment to approximately 600000 employees, which includes a substantial number of women in Sri Lanka. Around 350 garment factories are operating in different parts of the country, while around 16 textile and fabric manufacturing units are in operation. The data retrieved from 2018 Economic statistics of Sri Lanka published by Department of Census & Statistics shows the sectorial composition in total exports as follow.

Table 01; Value of exports by principal commodity, 2014-2017(Rs. Mn)

Item	2014	2015	2016	2017
Total exports	1,442,019	1,388,186	1,487,652	1,739,728
Tea (Black or Green)	212,588	182,054	184,778	233,338
Rubber	5,916	3,548	4,758	5,920
Coconut & coconut products	51,772	54,215	61,138	65,067
Garment	618,811	627,708	680,346	734,727
Precious stones	50,389	32,711	31,258	40,594
Other exports	502,543	487,950	525,374	660,082

Figure 01; Value of exports by principal commodity, 2014-2017(Rs. Mn)



The apparel sector records the highest contribution to the total exports by 42% while rubber sector records the lowest contribution to the total exports.

Satisfaction is a person's feelings of pleasure or disappointment that result from comparing their perceived performance to their expectation. Hossan, Sarker, & Afroze (2012) stated that employee's job satisfaction is the overall effective state of mind resulting from an approval of all aspects of his work. Work satisfaction is an expression that is used to describe the attitude an worker has towards the work and associated role and responsibilities, where a highly satisfied worker will have a perfect positive attitude towards the work and vice versa (Pushpakumari, 2008).

Researchers proposed many theories based on job satisfaction. The following are the few theories formulated by them.

Dispositional approach

The dispositional approach suggests that individuals vary in their tendency to be satisfied with their jobs, in other words, job satisfaction is to some extent an individual trait or individual quality. Researchers also indicate that identical twins raised apart have similar levels of job satisfaction.

Equity Theory

Equity Theory shows how a person views fairness in regard to social relationships such as with an employer. A person identifies the amount of input (things gained) from a relationship compared to the output (things given) to produce an input/output ratio. For example, consider two employees who work the same job and receive the same pay and benefits. If one individual gets a pay raise for doing the same work as the other, then the less benefited individual will become distressed in his workplace. If, on the other hand, both individuals get pay raises and new responsibilities, then the feeling of equity will be maintained.

Two-factor theory or motivator-hygiene theory

Frederick Herzberg's two-factor theory, also known as motivator-hygiene theory attempt to explain satisfaction and motivation in the workplace. This theory states that satisfaction and dissatisfaction are driven by different factors motivation and hygiene factors, respectively. An employee's motivation to work is continually related to job satisfaction of a subordinate. Motivating factors are those aspects of the job that make people want to perform, and provide people with satisfaction, for example achievement in work, recognition, promotion opportunities. These motivating factors are considered to be intrinsic to the job, or the work carried out. Hygiene factors include aspects of the working environment such as pay, company policies, supervisory practices, and other working conditions.

As job satisfaction is a key component for the survival of any organization it is much more important to identify the factors that influence to the job satisfaction of the employees. Malik, et al., (2012) states a set of factors have impact on a person's job satisfaction including compensation, promotion, job security, workplace, transport facilities, training and development, behavior of managers. Dawal &Taha, (2006) showed that job and environmental factors were significantly related to job satisfaction. They highlighted the significant influence of age, work experience and marital status on job satisfaction. Further, environmental factors, especially the surroundings, context dependence and the building's function, also had a significant impact on job satisfaction.

Among these factors the organizational factors such as Salary, working environment, Supervision, rules and regulations of the organization and promotion opportunities have been considered in this study. Wages play a significant role in influencing job satisfaction. When pay or wages is seen as fair, based on job demands, individual skill level and community pay standards, satisfaction is likely to result. Salary is found to be the main factor of motivation and job satisfaction of employees and it is also identified as a motivator for an employee and commitment with the organization which this will enhances attraction and retention of employees (Moncarz , Zhao, & Kay, 2009), (Chiu , Luk , & Tang , 2002).

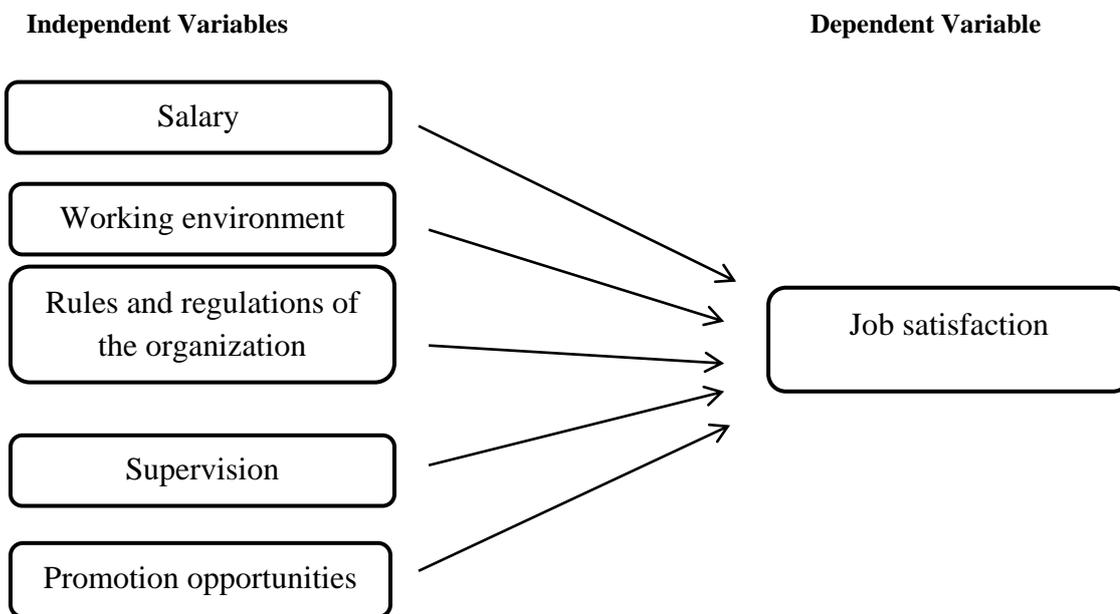
Working condition that is compatible with an employee's physical comfort can contribute to job satisfaction. Temperature, humidity, ventilation, lighting and noise, hours of work, cleanliness of the workplace and adequate tools and equipment are the features which affect job satisfaction. Bakotic & Babic (2013) found that workplace condition is a vital issue for job gratification and workers under a hostile working situation are not that much satisfied.

The desire for promotion is generally strong among employees as it involves change in job content, pay, responsibility, independence, status and the like. Promotion is the ultimate achievement in his career and he feels extremely satisfied with it. Another important variable determining job satisfaction is employee promotion. It is something that gives a drive to cherish a better career. From the study of Shields & Ward, (2001) it is very much clear that dissatisfaction with promotion and training opportunities has a stronger effect on intentions to quit than dissatisfaction with workload or pay. Organizational policies like effective promotions, transfer of people, foreign assignments, appraisal and reward system, motivational methods, skill based and job based pay can provide job satisfaction among employees.

To a worker, Supervision is equally a strong contributor to the job satisfaction as well as to the job dissatisfaction. The feelings of workers towards his supervisors are usually similar to his feeling towards the company. The role of supervisor is a focal point for attitude formation. Bad supervision results in absenteeism and labor turnover. Good supervision results in higher production and good industrial relations. Supervisory behavior has become the influential success factor of organizations, both public and private (Young, 2009). Supervision includes technical knowledge, human relation, skill and coordination of work activities. The style of supervisory behavior possessed by a supervisor is known to be a vital factor leading to the success or failure of an organization (Adebayo, 2007).

03. Methodology

Through this research researcher aims to test the Salary, working environment, Supervision, rules and regulations of the organization and promotion opportunities ‘that influences on job satisfaction of the apparel sector employees. Thus, the conceptual framework is illustrated as follows to implement the relationship among variables.



Thus following hypothesis can be developed.

- H₁: There is a significant relationship between the Salary and the job satisfaction of the apparel sector employees.
- H₂: There is a significant relationship between the Working environment and the job satisfaction of the apparel sector employees.
- H₃: There is a significant relationship between the Rules and regulations of the organization and the job satisfaction of the apparel sector employees.
- H₄: There is a significant relationship between the Supervision and the job satisfaction of the apparel sector employees.
- H₅: There is a significant relationship between the Promotion opportunities and the job satisfaction of the apparel sector employees.

This study falls into the category of basic research. The primary purpose of such a basic research is to generate a body of knowledge and understanding of the phenomenon of interest and build theories based on the research results. No artificial environment was created by the researcher to test the effect. The respondents were made to answer the questions from where they are by imagining the circumstance tested. Therefore the interference caused by the researcher is minimal in this research. The type of the investigation used by the researcher is correlation. The study was conducted using the correlation research design because

the study was intended to investigate the influence of organizational factors on the job satisfaction of Apparel sector employees. According to Fraenkel & Wallen (1988) correlation research describes an existing relationship between variables. The study took the quantitative approach because it was based on variables measured with numbers and analyzed with statistical procedures.

This research is focused on deciding the relationship between Salary, Working environment, Rules and regulations, Supervision, Promotion opportunities and job satisfaction of the apparel sector employees in Anuradhapura district. Researcher chose Rich Light Exports (Pvt) Ltd. Situated in Kekirawa as the organization to collect the data. Data was collected from all section employees as mentioned in the table No.2. Therefore, the unit of analysis in this study is individual. Questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest. Questionnaires can be administered personally, mailed to the respondents, or electronically distributed (Sekaran & Bougie, 2013). In this study researcher administered questionnaires personally.

Table 02; Employee carder for October 2019

Area of employment	Non Managerial		Managerial	
	Population	Sample	Population	Sample
Production	620	83	30	04
Human Resource	03	01	02	01
Finance	03	01	02	01
Administration	50	06	08	03
Total	676	91	42	09

Source; Organization details

As per the sample that builds upon stratified sampling technique 91 non managerial employees and 09 managerial employees were selected to achieve the research objectives as mention in the sample design. The researcher personally handed over the questionnaire to the employees and collected the necessary information.

The following tables indicate the measurement scales that can be used to measure each variable.

Table 03; Scales of Measurement

Variable	Level of measurement
Demographic factors	Nominal
Dependent variable	Ordinal
Independent variable	Ordinal

Source; Author developed

In this research, descriptive statistics and inferential statistics were used to justify the quantitative nature of the data collection. Descriptive statistics usually involved measures of central tendency (mean, median, mode) and measures of dispersion (variance, standard deviation, etc.) and Inferential statistics involved to measure Multiple Linear Regression, Correlation Coefficient, ANOVA and Independent sample T-test was used to test the hypotheses. Correlation explains the relationship between variables. The study used correlation analysis to measure the relationship between dependent and independent variables. Statistical Package for Social Science (SPSS) version 16.0 software used to analyze the both descriptive analysis and inferential analysis.

04. Results and Discussion

For the research study, has considered 100 employees as the sample of the research. According to the organization records total of 718 employees are including in the carder for the month of October 2019. At the 95% confident level and confident intervals at 5% for a population of 700, sample size should be 248 (Sekaran & Bougie, 2013). But considering time limitations and other restrictions sample size selected as 100.

Reliability analysis

Table 04 ; Reliability analysis

Variables	No of items	Cronbach's Alpha
Job Satisfaction	08	0.682
Salary	04	0.771
Working Environment	04	0.661
Rules and Regulations of the organization	04	0.649
Supervision	04	0.644
Promotional opportunities	04	0.697

Source; survey data (2019, October)

Cronbach's alpha is computed in terms of the average inter correlations among the items measuring the concept (Sekaran & Bougie, 2013). Cronbach's alpha should be greater than its' minimum value of 0.700 and considered questions in the questionnaire can be accepted. In the aspect of undergraduate researches the minimum value of cronbunch alpha is allowed up to 0.600. According to the above table questions in the questionnaire can be accepted in terms of all the variables. For all the variables Cronbach's alpha range from 0.644 to 0.771.

Descriptive statistics for independent variables

Table 05 ; Descriptive statistics for independent variables

Variables	Mean	Std.Dev	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std.Error	Statistic	Std.Error
Salary	4.0750	.41210	-.591	.241	-.378	.478
Working Environment	2.9250	.35266	-.330	.241	.265	.478
Rules and Regulations of the organization	3.1250	.51309	.794	.241	1.322	.478
Supervision	3.3225	.48630	.127	.241	.400	.478
Promotional opportunities	3.0725	.35763	.064	.241	-.349	.478

Source; survey data (2019, October)

Above table describes descriptive statistics of responses of respondents related with independent variables of the study. According to the above table, mean value for Salary indicates that salary makes a significant impact to the job satisfaction of apparel sector employees (M=4.0750.46, SD=0.41210). And in case of working environment it also shows a low significance than other variables (M=2.9250, SD= 0.35266) towards the job satisfaction of apparel sector employees. Mean value of Rules and Regulations of the organization (M=3.1250, SD=0. 51309) and Promotional opportunities (M=3.0725, SD=0.35763) too are high indicating that both variables are favorably influencing to the job satisfaction of apparel sector employees. And in case of Supervision (M=3.3225, SD=0.48630) high indicating that it has high impact on the to the job satisfaction of apparel sector employees.

Descriptive statistics for dependent variable

Table 06 ; Descriptive statistics for dependent variable

Variable	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Job satisfaction	3.3713	.53815	-.575	.241	.682	.478

Source; survey data (2019, October)

According to the data presented in table above, the respondents of sample shows high level of job satisfaction. According to the above table the job satisfaction of the apparel sector employees is significantly high (M=3.3713, SD= 0.53815).

Gender comparison

Table 07 ; Gender comparison

Gender	Mean	Std. Deviation	t value	Sig.
Female	3.4768	.51800	-3.125	.930
Male	3.1250	.51486		

Source; survey data (2019, October)

According to the above table, both female and male have taken higher mean values respectively (M=3.4768), (M=3.1250). The results of t-test further reveals that there is no significant difference between these two groups on the job satisfaction of the apparel sector employees. (t= -3.125, p>0.05).

Category of employee comparison

Table 08 ; Category of employee comparison

Employee category	Mean	Std. Deviation	t value	Sig.
Non managerial employ.	3.4063	.67732	-2.299	.424
Managerial employees	2.9861	.51135		

Source; survey data (2019, October)

According to the above table, both Non managerial employees and Managerial employees have taken higher mean values respectively (M=3.4063), (M=2.9861). The results of t-test further reveals that there is no significant difference between these two groups on the job satisfaction of the apparel sector employees. (t= -2.299, p>0.05).

Correlation and Regression Analysis

In regression analysis job satisfaction was entered as dependent variable and Salary, Working Environment, Rules and Regulations of the organization, Supervision and Promotional opportunities as the independent variables. The results are produced in following tables.

Table 09 ; Overall model fit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.557 ^a	.310	.273	.45879

Source; survey data (2019, October)

The Adjusted R Square value is 0.273 which means 27.3% of the factors affecting on the job satisfaction of the apparel sector employees can be explained by the Salary, Working Environment, Rules and Regulations of the organization, Supervision and Promotional opportunities.

Table 10 ; ANOVA result

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	8.884	5	1.777	8.442	.000 ^b
Residual	19.786	94	.210		
Total	28.670	99			

Source; survey data (2019, October)

The P value from the ANOVA table is less than 0.001, which means that at least one of the five variables Salary, Working Environment, Rules and Regulations of the organization, Supervision and Promotional opportunities can be used to model the job satisfaction of the apparel sector employees.

Table 11 ; Coefficient results

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.638	.790		2.072	.041
SA	.246	.117	.189	2.099	.038
WE	.305	.149	.200	2.046	.044
RR	.324	.101	.309	3.220	.002
SU	.260	.098	.235	2.657	.009
PR	.090	.134	.060	2.070	.944

Source; survey data (2019, October)

According to the table P values for Promotional opportunities is 0.944. Hence, this variable is not significant prediction to the job satisfaction of the apparel sector employees, The P values for the Salary, Working Environment, Rules and Regulations of the organization, Supervision are 0.038, 0.044, 0.002 and 0.009 respectively. Thus these variables are significant predictors effecting on the Salary, Working Environment, Rules and Regulations of the organization, Supervision. According to the results of the Correlation and regression analysis the final findings can be developed as follows.

Table 12 ; Final results

Hypothesis	Correlation Analysis		Accept/Reject	Regression analysis		Accept/Reject	Findings
	R	P		β	P		
H1: There is a significant relationship between the Salary and the job satisfaction of the apparel sector employees.	0.191	0.047	Accept	0.189	0.038	Accept	Accept
H2: There is a significant relationship between the Working Environment and the job satisfaction of the apparel sector employees.	0.378	0.000	Accept	0.200	0.044	Accept	Accept

H ₃ : There is a significant relationship between the Rules and regulations of the organization and the job satisfaction of the apparel sector employees.	0.424	0.000	Accept	0.309	0.002	Accept	Accept
H ₄ : There is a significant relationship between the Supervision and the job satisfaction of the apparel sector employees.	0.292	0.000	Accept	0.235	0.009	Accept	Accept
H ₅ : There is a significant relationship between the Promotional opportunities and the job satisfaction of the apparel sector employees.	0.129	0.200	Reject	0.060	0.944	Reject	Reject

Source ; Author developed

Discussion of the study

The main purpose of the research was to identify the factors that are most likely to influence on the job satisfaction of the apparel sector employees. Five hypotheses were established and four of those were accepted

while one hypothesis was rejected.

The first hypothesis of the study proposed a significant relationship between salary and the job satisfaction of the apparel sector employees. The results of the correlation analysis identifies that there is a significant ($P= 0.047$) as well as relatively a less positive relationship ($R= 0.191$) between the dependent and independent variable. This means the job satisfaction will be increased if the salary level is increased among the apparel sector employees.

The second hypothesis considered in the thesis was that there is a significant relationship between working environment and job satisfaction of the apparel sector employees. The correlation results showed that there was a positive relationship and regression results also found that there is significant relationship between the two variables.

The third hypothesis established was that there is a significant relationship between rules and regulations of the organization and job satisfaction of the apparel sector employees. And this hypothesis was also able to accept in the sample considered in the current study though correlation analysis. It was proved by the results of both Correlation and Regression results.

As the researcher has developed the fourth hypothesis in the thesis, there is a significant relationship between Supervision and the job satisfaction of the apparel sector employees. This hypothesis too was accepted revealing there is a significant positive relationship between the considered two variables. A strong literature base (Adebayo, 2007), (Young, 2009) was built by the researcher in order to build this hypothesis.

The relationship between Promotional opportunities and the job satisfaction of the apparel sector employees was developed as the fifth and final hypothesis of the study. As the results of the correlation analysis the hypothesis is rejected by correlation analysis ($R=0.129$, $P=0.200$). And it was proved by the regression results indicates that there is no significant relationship between these two variables.

05. Conclusion and Recommendations

Conclusion

This study was conducted in order to find out the factors influencing on the job satisfaction of the apparel sector employees in Anuradhapura district. As Salary, Working Environment, Rules and Regulations of the organization, Supervision and Promotional opportunities are significant factors which affects to the job satisfaction of the apparel sector employees, researcher has used these five among many factors that job satisfaction is affected. The researcher identified these five factors that are most likely affects to the job satisfaction of the apparel sector employees through reviewing the existing literature in order to achieve the first objective of the research.

The second objective of the study was to investigate the impact of each individual factor on job satisfaction of apparel sector employees. It was done by using Correlation and Regression analysis. The results were mentioned in the Results and discussion

part and as per the results except promotional opportunities other factors are positively influencing on the job satisfaction of the apparel sector employees. By that second objective was accomplished.

The third objective of the study was to examine the factor influences mostly on job satisfaction of apparel sector employees. Using the correlation values which was taken through correlation analysis it was cleared that the job satisfaction of the employees is affected heavily by the rules and regulations of the company. Hence the third objective was accomplished.

By using the appropriate statistical package it is found that Salary, Working Environment, Rules and Regulations of the organization and Supervision are affecting to the job satisfaction of apparel sector employees. Hence four hypotheses were accepted while one hypotheses was rejected. Thus the hypotheses H₁, H₂, H₃, H₄ and H₄ were accepted while H₅ was rejected.

Recommendations

As per the results of the study following recommendations can be produce. The study reveals that the organizations that provide a satisfactory salary level have more satisfied employees. Having ability to give a decent salary level, fulfilling the employees family desires through the salary level, describing the incentive scheme in a proper manner which the employees could understand will enhance the job satisfaction of the apparel sector employees. Thus management of the organizations needs to make steps to enhance availability of these predictors on salary level within the employees through a well-planned proper methodology.

Employees are people who always seek a favorable working environment. Availability of pleasant physical environment, Provision of lighting and ventilation facilities at the work place, Efficiency of the equipment and tools at the work place, Provision of sanitary facilities available are the mostly asked factors by the employees and by providing these indicators employees would be highly satisfied. To make pleasant environment authorities should take necessary steps to design the entire organization area in a proper manner. For that all the management including all levels within the organization must come together in to one table and they must reveal the ideas to make this thing in an effective manner. By that we can build up a proper organization environment within the company.

Employees are highly satisfied if the rules and regulations are in a favorable manner for them. The policies of management create conducive work environment, Management aims on practicing rigorous HR practices, Scheduled proper work breaks within the work time, Trust and openness strategies, rules and regulations of the management are some factors that the management should consider when carrying out organization rules and regulations. As this was the most affected factor to the job satisfaction of the apparel sector employees it is very much important to carry out a proper methodology for rules and regulations of the organization.

With regard to Supervision, most of the employees who work with supervisors seek a proper supervision to carry out their jobs. If the supervisor actively listens to employee suggestions, if the supervisor promotes an atmosphere of teamwork, if supervisor provides employee with actionable suggestions on what employee can do to improve, if the employees have questions or concerns and supervisor is able to address them the employees are highly satisfied. It is clear that the supervisors must act smart with the employees. Then the employees will feel that supervisors are always with them. This is a highly motivate factor to the job satisfaction of the employees.

As an overall the authorities of the organizations are capable to uplift these four factors within the organization. Mostly this can be done through the inauguration period of the employees. So that the employees would feel positive attitude towards the organization. It will ultimately affect to the performance of the organization.

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Policy Responsibilities In Police Report Handling On Criminal Actions Related To Good Government General Principles (AUPB)

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I. BACKGROUND

The police as part of the State Administration Agency, and members of the police as personally police officers, can be held accountable, meaning that there is an act of responsibility, or something that is accountable.

Generally there is no point in including obligations or prohibitions for citizens in the state administrative legislation, when the rules of conduct cannot be imposed by the state administration (in the case where necessary).¹ What criteria are used to designate an action as a legal measure for state administration? To draw a distinction between government actions based on public law and private legal actions can be done using basic criteria to carry out legal actions. For the Government the basis for carrying out public legal actions is the existence of authority relating to a particular position (*ambt*).²

Responsibility is the basic willingness to carry out what is required by it. "*Respondeo ergo sum*" (I am responsible, so I am there), said Emmanuel Levinas. The description as follows: Freedom provides choices for humans to behave and behave. Therefore, humans are responsible for the choices they have made.³

Regarding police responsibilities, Muhammad Tito Karnavian and Hermawan Sulistyio revealed that the police are currently challenged to meet public demands. The quality that must be fulfilled by the police, among them is "responsible". The police must recognize the nature and level of authority of their discretion and must always be accountable to the public (community), and legislation. The police must be as transparent as possible in their decision making.⁴

It is undeniable that the community needs the presence of a police agency to create order and security. In the context of public order in the country, the existence of institutions and the role of

the police in Indonesia can be understood through several limits of understanding and concepts that will fully describe the functions of the police. The police are also required to behave in repairs. Improvement here means before and after an event occurs called preventive behavior that is to foster and develop the potential and strength of the community in deterring, preventing and overcoming all forms of violations of the law and the implementation of protection, protection, and service to the community.⁵

Community relations with the police are very close. It is difficult to separate the close relationship between the community and the police. The police and the community are likened to water like fish. There is no society without police. On the contrary, the existence of the police cannot be separated from the community. Where there is a community there is an institution called the police (*ubi societas ubi politie*).⁶

The main function of the government is to provide services, conduct development and organize government to regulate and take care of the community. The implementation of public services has a dimensional aspect, therefore in the discussion and implementation of the implementation strategy it cannot be based on only one aspect, for example only economic or political aspects. The approach must be integrated to cover other aspects, such as socio-cultural aspects, geographical conditions and legal / regulatory aspects.⁷

Information regarding the actions of the police apparatus, for example the reasons underlying the action, the form of the action as well as the time and manner of action, must be available to the wider community. The need for the public to know the actions of the police, is also part of the control of the police. Therefore according to Roy Reming as quoted by Suwarni⁸, that the wider audience must know how the police handle a crime: from arrest to surrender to the prosecutor's office. What was SP3 (terminated investigation) was also widely announced to the

¹ Philipus M.Hadjon et al, *Pengantar Hukum Administrasi Indonesia – Introduction To The Indonesian Administrative Law*, Gajahmada University Press, Yogyakarta, 2002, h.245.

² *Ibid.*, h.139.

³ Muhamad Erwin, *Fulsafat Hukum – Refleksi Kritis terhadap Hukum dan Hukum Indonesia (dalam Dimensi Ide dan Aplikasi)*, PT. RajaGrafindo, Jakarta, 2015, h.340.

⁴ Muhammad Tito Karnavian dan Hermawan Sulistyio, *Democratic Policing*, Penerbit Pensil-324, Jakarta, 2017, h.45.

⁵Rycko Amelza Dahniel dan Surya Dharma, *Perilaku Organisasi Kepolisian*, Pustaka Pelajar, Yogyakarta, 2014, h.7.

⁶Pudi Rahardi, *Hukum Kepolisian*, Penerbit Laksbang Grafika, 2014, h.187.

⁷Hardiyansyah, *Komunikasi Pelayanan Publik*, Penerbit Gava Media, Yogyakarta, 2015, h.15.

⁸Suwarni, *Reformasi Kepolisian – Studi atas Budaya Organisasi dan Pola Komunikasi*, Penerbit UII Press, Yogyakarta, 2010, h.5.

public, complete with the reasons. This method can be a strong control for the police to minimize opportunities for corruption. The service of handling Criminal Reports is part of the role of the Indonesian National Police in maintaining security and public order, enforcing the law, as well as providing protection, protection and services to the public in the context of maintaining domestic security.

AUPB can be understood as general principles that are used as a basis and procedure for the implementation of good governance, in such a way that the administration is good, polite, just and respectable, free from tyranny, violation of regulations, acts of abuse of authority, and arbitrary actions.⁹

II. FORMULATION OF THE PROBLEM

Based on the above background, a problem can be formulated, namely how is Handling of Police Reports Regarding Criminal Acts Associated With AUPB?

III. DISCUSSION

In "responsibility" contained the notion of "cause". People are responsible for something caused by it. People who are not the cause of something by it, are also not the cause of an effect and cannot be held accountable.¹⁰ But to be responsible, it is not enough for a person to become a cause, it is also necessary for people to become a cause of "free". Freedom is an absolute requirement for responsibility.¹¹

For our moral awareness, a cause must be free to be held responsible. That means that only man as a rational being can be held responsible and he is only responsible insofar as he is free.¹² With a strategic position in the justice process, ideally the police are filled with professional people with high integrity. The police are expected to be independent and independent and have apparatus that can carry out state power in the field of law enforcement and public services in a proportional, professional and fair manner. This demand should not be excessive, considering that in various circumstances / difficulties it is very possible for members and leaders of the National Police to commit corruption, namely in all functions and parts of the National Police organization the opportunity to do so, let alone the functions relating to public services.¹³

According to a bureaucratic perspective, *responsibility* is the responsibility arising from giving authority by superiors to carry out a policy. While *accountability* is an obligation to explain how the realization of the authority it has received. Accountability involves how the attitude and character of humans, both internally and externally. Someone said to be accountable (internal), if the person concerned can account for what is done to God. A person is said to be accountable (external) if he can account for his actions and attitudes to his environment, both in the formal environment (subordinate relations with his superiors) and those that are external (community). Public accountability can also be

interpreted as an obligation of individuals or authorities for what is entrusted to him in managing public resources, to account for matters relating to fiscal, managerial and program.

accountability is closely related to the evaluation (evaluation) of the implementation of work (activities). The basic question is whether the standards created (which can be in the form of SOPs) have been implemented properly (accordingly) when officers face situations and conditions that must be resolved. Accountability is an instrument to control the extent to which officers can provide results in providing services to the community.

A good government is a government that does not only work on the routine work that has been made before. However, the government is able to involve the public, private sector and other interest groups to play an active role and become an equal actor in improving public services.¹⁴

Philosophical foundation is the foundation that is "ideal" to motivate law enforcement officers, direct the spirit and dedication of the service of law enforcement, and realize the nobility of truth and justice. Thus, every law enforcement action must be aligned with the ideals contained in the spirit and nobleness of the intended philosophical goals. The philosophical foundation of the Criminal Procedure Code (KUHAP) as can be read in letter a considerations, is none other than Pancasila. The philosophical foundation of the Criminal Procedure Code is based on Pancasila, especially those that are closely related to the precepts of the Godhead and Humanity.

The Police Report on Crimes refers to the Regulation of the Head of the Indonesian National Police Number 14 of 2012 concerning Management of Criminal Investigations, Chapter I General Provisions Article 1 point 16, which states that the Police Report is a written report made by Polri officers about the existence of an incident that it is suspected that the criminal was found either by himself or through a notification given by someone because of rights or obligations based on statutory regulations.

Regarding the "report" in item 14 of the Republic of Indonesia National Police Chief Regulation Number 14 of 2012 concerning Management of Criminal Investigations, Chapter I General Provisions Article 1, the contents of which are the same as Article 1 point 24 of Law Number 8 of 1981 concerning Criminal Procedures (hereinafter referred to as the Criminal Procedure Code), stated: A report is a notification given by a person because of a statutory right or obligation to the competent authority regarding whether or has been or is suspected of a criminal event.

About officials authorized to receive reports mentioned in Article 5 of the Criminal Procedure Code are investigators. To find out who has the authority to conduct an investigation, we return to Article 1 point 4 of the Criminal Procedure Code which states that the Investigator is an official of the Republic of Indonesia police who is authorized by this law to conduct an investigation. According to the Criminal Procedure Code as formulated in Article 4 it is stated that the Investigator is every police official of the Republic of Indonesia. Strictly speaking: the investigator is

⁹Ridwan HR, *Op Cit*, h. 234.

¹⁰Muhamad Erwin, *Opcit*, h.341.

¹¹*Ibid.*

¹²*Ibid.*

¹³Suwarni, *Op Cit*, h.3.

¹⁴Agus Pramusinto dan Wahyudi Kumorotomo (editor), *Governance Reform di Indonesia*, Penerbit Gava Media dan MAP-UGM, Yogyakarta, 2009, h.310.

every police official. Prosecutors or other officials are not authorized to conduct an investigation. Investigation, a single monopoly for the Police.¹⁵

The role of the police in providing protection, protection and service to this community legally needs to obtain a legal basis. As an institution that carries out government functions in the field of maintaining security and public order, law enforcement, protectors, protecting and serving people based on the principle of legality (*rechtmatigheid*) regulated in the 1945 Constitution, Law No.8 of 1981 concerning the Criminal Procedure Code, Laws Law No.2 of 2002 concerning the National Police as well as other laws that specifically regulate, the police function consists of two functions, namely the preventive and repressive functions. The preventive function is carried out in order to provide protection, protection and service to the community, and the repressive function as a function of law enforcement. Therefore, in carrying out these government functions must rely on the principles of good governance as formulated in the AUPB.

Handling criminal report in the police is regulated in Article 4 Jo Article 5 paragraph (1) of the Criminal Procedure Code, which states that: "Investigators are any police officers of the Republic of Indonesia who, because of their obligations, have the authority to receive reports or complaints from someone about a criminal act". Therefore the handling of police reports on criminal acts is a KTUN issued under the Criminal Procedure Code. Whereas AUPB, are general principles that are used as a basis and procedure for the implementation of good governance, which in this way the administration of governance is good and free from violations of regulations and acts of abuse of authority. The availability of sanctions in relation to the implementation of duties and authority of the police is an important closing part in the law, not least in administrative law. In general, there is no point in including obligations or prohibitions and requirements for the police in the state administrative legislation which contains AUPB, when the rules of conduct cannot be imposed by state administration.

The responsibility for handling police reports on criminal offenses related to AUPB, is a form of legal liability for every action of a police official within the framework of legal authority and if the act exceeds legal authority, then it is considered as an act that must be legally accounted for. The form of legal liability is (a). Legal liability discipline, (b). Civil liability, (c). Legal responsibility of state administration, (d) Criminal liability. Referring to Article 10 of Law Number 30 Year 2014 concerning Government Administration related to AUPB, the use of authority in the service of handling police reports on crimes is normatively measured in line with the AUPB. Based on Article 2 point d of the UUPTUN it is stated that the KTUN based on the provisions of KUHAP are not included in the definition of KTUN according to the UUPTUN. Whereas Article 2 of the Police Law stipulates that the function of the police is one of the functions of the government of the state, so that the implementation of the duties and authority of the police referred to is in the context of carrying out governmental functions, and therefore police officers are Officials of State Administration Institutions. If the police in carrying out their duties and authorities issue a decree based on applicable laws, which are concrete, individual and final, cause legal

consequences for a person or a legal entity, then those who feel their interests are harmed by a State Administration Decree, which attempts the law is not accommodated by the Criminal Procedure Code and the Constitutional Court Decision Number MK. 21 / PUU-XII / 2014 which is related to the expansion of the competencies of the Pre-Judicial institution, then the person or legal entity can file a written claim to the State Administrative Court. Therefore, there is a legal problem in the form of conflicting norms between Article 2 letter d of the Company Law and Article 53 paragraph (2) point b of the Company Law. That is because based on Article 2 point d of the UUPTUN it is stated that the KTUN based on the Criminal Procedure Code are not included in the definition of KTUN according to the UUPTUN. Therefore the handling of police reports about criminal acts cannot be sued through the PTUN. Whereas according to Article 53 paragraph (1) of UUPTUN, it is stated that a person or legal entity who feels his interests have been harmed by a KTUN can file a written claim to the competent court which contains demands that the disputed KTUN be declared invalid or invalid, with or without a claim for compensation loss and / or rehabilitation. Article 53 paragraph (2) point b of the UUPTUN states that the reasons that can be used in the lawsuit as referred to in paragraph (1) are that the KTUN sued is contrary to the AUPB.

IV. CLOSING

In order to strengthen the responsibility of the police in handling police reports regarding criminal acts related to AUPB, it is recommended to the Government, namely that the availability of sanctions be related to the responsibility of the police in handling police reports regarding criminal acts related to AUPB, given that sanctions are an important closing part in the law, so there is no point in including obligations or prohibitions and requirements for the police in the state administrative legislation which contains AUPB, when the rules of conduct have no sanctions and cannot be imposed by state administration. Furthermore, it is necessary to synchronize and harmonize between Article 2 letter d of the Act on State Administrative Court (UUPTUN) with Article 53 paragraph (2) item b of UUPTUN, so that the KTUN is based on the provisions of the Criminal Procedure Code other than those provided by legal channels through Pre-Trial, also including in terms of KTUN according to the Company Law, so that the handling of police reports about criminal acts that are not in accordance with the AUPB can be sued through the PTUN.

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Secondary Schools Principals' Management Styles and Teacher Motivation in The Western Region of Kenya

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Abstract- This paper is based on an on-going postgraduate research study which is aimed at investigating the effect of different management styles of principals on teacher motivation in secondary schools. Effective management is one of the keys to any form of success in a system. Studies carried out in different nations including Israel, Nigeria, America, Uganda and Kenya emphasize the importance of good management in institutions. There are many issues in the society that question the role of school principals in relation to a teachers' performance in school. The Ministry of Education through Kenya Education Management Institute has established a programme of empowering managers through in-service training. Going by McGregor's X and Y theory, the purpose of this study was to investigate the effect of different management styles of principals on teacher motivation in the western region of Kenya. The objectives of the study included establishing secondary school principals' management styles and how they relate to teachers' motivation. The study adopted descriptive survey and correlation designs. To identify the respondents, random and stratified sampling techniques were used. The area of study was the Western Region of Kenya including; Vihiga, Kakamega, Bungoma and Busia counties with a total of 134,214,112 and 92 secondary schools respectively. 34 Quality Assurance Standards Officers, 552 school principals and 7,728 teachers formed the target population. The sample size consisted of 368 respondents: 4 Quality Assurance and Standards Officers, 24 school principals and 340 teachers drawn from the accessible population of 8,314 using purposeful and proportionate random sampling at 95% level of confidence. The sample size was determined by sampling the N^{th} . The response rate was at 89.20%. Data was collected using questionnaires and an interview schedule. The data collected was collated and analyzed using frequencies, means, Pearson's correlation coefficient, standard deviation and Analysis of Variance. The analyzed data was presented using tables. Version 21 of Statistical Package for Social Sciences aided the data analysis. In most cases the management styles used were transactional in the area and this did not motivate teachers. Teachers' efforts to keep on learning new ways and methods of teaching was fair but they were poor at keeping records of work. The study recommended the use of democratic management style which is transformative for better results in teachers' motivation.

Index Terms- Motivation, Autocratic, paternalistic, Persuasive, Democratic, Laissez- Faire, Transactional and Transformational styles.

I. INTRODUCTION

According to Hrebiniak and Lawrence (2005) management is an art of bringing people together with an objective of attaining some desired goals. It involves planning and organizing as well as sourcing, leading and directing them. Management would also involve controlling the organization towards preset goals. Effective management of institutions is the key to any form of success at any level in a system.

A World Bank (2010) report showed that Africa continues to face human development constraints in education. The scenario has, however, not changed since then. One of the reasons as to why employees perform dismally in a work place that has been supported by research includes poor leadership and low motivation. Several studies carried out in different nations including Israel, Nigeria, America and Uganda have underscored the contribution of good leadership to the management of learning institutions.

Fidler and Atton (1999) conceptualization shows that common management faults related to appraisal and development of teachers were as a result inappropriate management styles used by school principals.

A study by Aacha, (2010) shows that teachers' motivation is critical since they transmit knowledge, skills, and attitudes to learners. Satisfied teachers will give their best and much beyond duty in order to promote students'

performance (Mertler, 1992). Motivation has a direct influence on people's actions and behaviour towards goals (Analoui, 2000). In a school setting, motivation is either intrinsic or extrinsic (Sansone & Harackiewicz, 2000). Intrinsic positively influences individual behavior and achievement from within (Ryan & Deci, 2000) while extrinsic, is from external environment's influences. Arguably therefore, behaviors can be changed through manipulation of extrinsic factors, the main being organizational management.

One of the reasons that reduce organizational effectiveness and productivity is the low level of organizational commitment due to unmotivated employees. Studies carried out on this subject indicate that in the case of low level of organizational commitment, organizational trust decreases (Yilmaz, 2008). If at all, the organizational trust decreases, it is rare that one should expect to get maximum satisfaction from the employees. For organizational commitment to be evident, each employee should be motivated to contribute positively to the organizational objectives. The manager too contributes to employee performance depending on his or her management styles.

Bogler and Somech (2004) argue that when employees are engaged within the organization, they then aspire to have an impact on its programmes, procedures or strategies. Employees who are motivated intrinsically perform their work very well. This kind of motivation could be emanating from the manager's style of management. Teachers in secondary schools just like any other organization need to be intrinsically motivated to perform their duties satisfactorily (Musera, Achoka, & Mugasia, 2012).

The study at hand explored this by looking at how different management styles of principals affect teachers' motivation.

II. OBJECTIVE OF THE STUDY

- i. To determine the relationship between secondary school principals' management styles and teachers' motivation in the Western Region of Kenya.

Research Hypothesis

The Null Hypothesis of this study was derived from the objective above;

H₀₁: There is no statistically significant relationship between secondary school principals' management styles and teachers' preparation in the Western Region of Kenya.

Transactional Leadership Styles

According to Hackman and Johnson (2009), transactional leadership approach establishes a criteria for rewarding employees in terms of creativity, performance and behavior. Leaders that exhibit this kind of leadership provide rewards for the workers' effort by recognizing their performance. Transactional leaders appreciate good performance of employees. Northhouse (2007) clarified that transactional leaders interchange prizes for the specific outcome. This style of leadership improves interaction between a leader and workers at the same time improving performance and the quality of products.

Transformational Leadership Styles

Northhouse (2007) defined transformational leadership as a process whereby a leader engages with workers and creates a connection that raises the level of motivation and morality in both of them. Koh, et al. (1995) linked transformational leadership to three phenomenon acts. The first act is that transformational leader recognizes the need for revitalization. The leader puts an effort on the challenges which might affect the organization. The second act is that the leader has to create a new vision. The leader focuses the attention on a vision of the future, and the third act is institutionalization of change. The leader puts an effort to transform the organization. Hackman and Johnson (2009) saw transformational leaders as innovative and foresighted, interactive, visionary, empowering, and passionate.

Principals' Management Styles and Teachers' Motivation

Motivation involves a number of factors including psychological ones that start and maintain activities towards the fulfillment of personal goals and refers to reasons that underlie behavior that is characterized by willingness and volition. Motivation of teachers can have several effects on how learners learn and their behavior towards subject matter (Ormord, 2003). Motivation of teachers in the education sector can direct behavior of the teachers towards particular goals, thus, leading to increased energy and effort, increased limitation of and persistence in activities, enhanced cognitive processing, determining what consequences would be reinforced and it could also lead to improved performance. Orphilms (2002) was of the thought that motivated teachers always looked for better ways to work and as a result they were more productive. Therefore, motivated teachers were determined to offer their best services to achieve the maximum output in qualitative education (Research Clue, 2017)

A study carried out by Kongnyuy (2015) indicated that the school administration may find it difficult to motivate and manage teachers to ensure optimal performance. Adequate and effective motivation strategies not necessarily,

financial rewards need to be identified and implemented in secondary schools for teachers to be efficient and effective, thereby, maximizing their output.

Teacher motivation could follow the principal’s management style. As regards untrained teachers, serious time-lag effects have often been mitigated by high rates of wastage and turnover among the teachers (Williams, 2003). According to Okumbe (1998) the head teacher must supervise teachers in order to stimulate them towards greater pedagogical effectiveness and productivity.

A study carried out by Jabuya (2010) on the influence of teacher motivation and teacher performance in secondary schools in Uriri was questionable following the lack of compensation to the many assignments given by head teachers. One of the objectives was to determine whether head teachers had a hand to influence the motivation of teachers’ performance in secondary schools. This however did not consider their management styles. This study was to look into determining whether the principals’ management styles had any effect on the level of teachers’ motivation in performing their work.

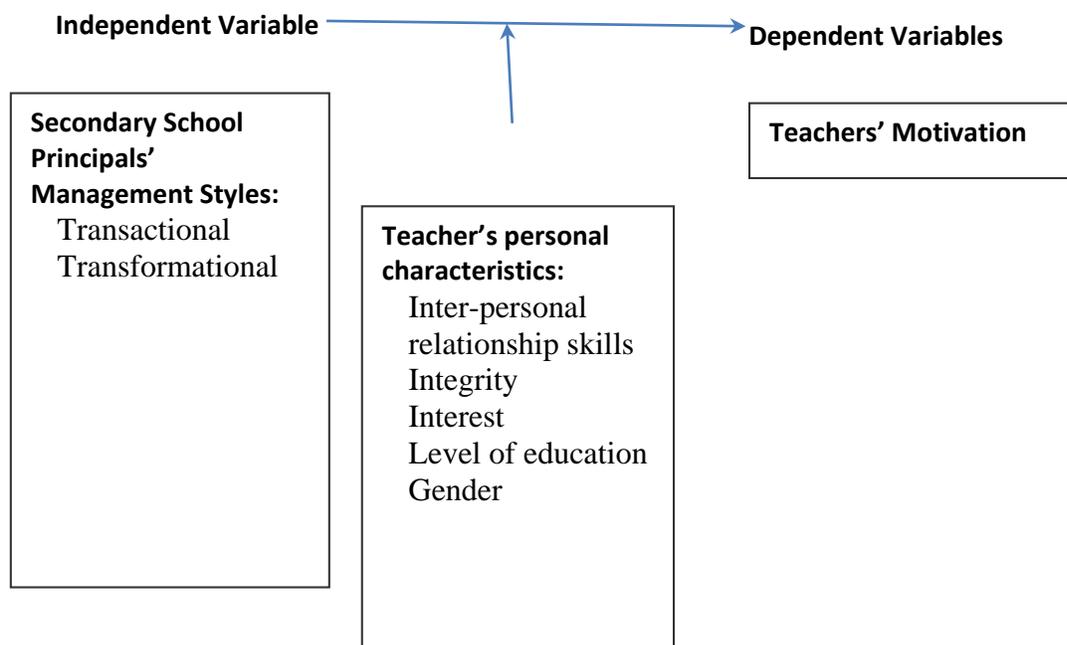
Theoretical Framework

This study was anchored on Abraham Maslows Hierarchy of needs theory. Abraham Maslow developed a theory of human needs allayed in a hierarchical order that ascends from the lowest to the highest (Nachmias & Nachmias, 1996). He postulated that when human need is satisfied, it becomes a motivator. The needs in the Maslow hierarchy of needs include physiological needs that sustains human life which are food, shelter, water, air; security and/or safety needs. These involve the secured feeling ones gets in an environment. In addition, there are safety needs that centers on love and belonging-ness. Above safety are the esteem needs that are about acceptance, prestige and status. At the apex is self-actualization, a feeling of highest possible level of attainment. Maslow’s theory has its place and importance to educational administrators because, within the context of this study, they needed awareness that teachers were human beings with life aspirations that needed to be met and satisfied stage by stage to all levels. Meeting and resolving these needs would foster a good working relationship at school while improving work performance. Failure to meet the needs would lower their morale, lead to more absenteeism, ineffectiveness and eventual low output.

Conceptual Framework

The study was guided by a conceptual framework which depicts the relationship between the key variables in the study. The independent variable was Secondary School Principals’ Management Styles and the dependent variable was teachers’ motivation. Considering the variables involved in this study there was a relationship between investigated management styles and performance of teachers in and out of class considering teachers’ preparation to teach and the teaching itself. However, there were intervening variables such as the teacher’s personal characteristics that could affect how different management styles relate to teachers’ performance which were held constant. The intervening variables were seen to control the effect of the independent variable on the dependent variable and vice-versa. For the sake of getting valid results the intervening variables were controlled by the use of randomization to reduce systematic errors. Figure 1 shows the interplay between variables that were investigated in the study.

Figure 1: shows the interplay between variables that were investigated in the study.



Target Population

The target population for this study comprised of 134, 214, 112 and 92 secondary schools in Kakamega, Bungoma, Busia and Vihiga Counties respectively with 34 QASOs, 552 school principals and 7,728 teachers of secondary schools. The population consisted of individuals of different characteristics brought together by a common curriculum and who were in charge of the Kenyan learners. The target population was calculated using a total of 4 counties and 552 schools from within the four counties and a total of 552 schools.

Sample Size and Sampling Technique

Sample Size

The researcher sampled with confidence considering that there was a high probability that the study was accurate statistically, with the correct sample size. Usually, the confidence level is a constant value needed for the equation, referred to as a Z-score. For this study, the Z-score from a Z Score table was 1.96 corresponding to 95% level of confidence. The study considered to use .5 standard deviation and +/- 5% as a margin of error (confidence interval) to mathematically calculate the sample size using the formula provided below:

$$\begin{aligned}
 \text{Sample Size} &= (Z\text{-score})^2 * StdDev*(1-StdDev) / (\text{margin of error})^2 \\
 &= ((1.96)^2 * .5(.5)) / (.05)^2 \\
 &= (3.8416 * .25) / .0025 \\
 &= .9604 / .0025 \\
 &= 384.16
 \end{aligned}$$

385 respondents were needed

Table 1: Sample Size of the Study

Category	QASO	Principals	Teachers	TOTAL
Target Population	34	552	7,728	8,314
Sample Size	4	24	340	368

Respondents	Number Targeted	Number Responded	Response Rate
QASOs	4	4	100.00%
Principals	24	22	91.67%
Teachers	340	303	85.86%
Total	368	329	89.20% (Average Overall)

Source: Field Data (2016)

Table 2: Response Rate

III. METHODOLOGY

This study utilized the descriptive survey research design and correlation designs. Descriptive survey research design was chosen because it had the ability to allow rapid collection of data from a representative sample population (Mugenda & Mugenda, 1999). Kothari (2003) explains that descriptive survey is basically concerned with describing, recording, analyzing and interpreting conditions and relationships just as they exist at present without manipulating the existing variables. Borg, Gall and Gall (1996) states that the descriptive survey design is intended to produce statistical information about aspects of education that interest policy makers and educators. This descriptive design is considered an appropriate tool of collecting given information, when the goals of the research call for both qualitative and quantitative data.

The Correlation design was also employed in this study to illustrate in numerical terms the degree to which variables were related which could not be achieved by descriptive survey. Correlational research is described as a form of non- experimental research in which the researcher measures two variables and assesses the statistical relationship between them with little or no effort to control extraneous variables.

These designs were suitable for the research problem because they could be used to explore and explain the existing status of the management styles in secondary schools. These designs would enable the study to relate management styles of secondary school principals to teacher motivation.

Instruments of Data Collection

Data was collected using both primary and secondary sources. The primary sources entailed data collected first hand from the QASOs, principals and teachers. Secondary sources of data were records in schools starting with what the administration had done already in providing different management styles in the school. The main instruments used in data collection included, two self-constructed questionnaires; an interview schedules and an observation check list.

Questionnaires

The researcher structured closed ended and open ended questions to obtain important information on secondary schools' principals' management styles and different parameters of teacher performance. The study used two different questionnaires; principals' questionnaire and teachers' questionnaire. The respondents were given freedom to respond to the questionnaire items without identifying themselves. Respondents were given a whole day, which was adequate time to give well thought out answers.

Interview Schedule

The researcher interviewed QASOs in order to get a clear picture of the management styles employed by specific principles and how these styles impacted on the way teachers performed their duties. The interview schedule had both closed ended and open ended items which gave the study reliable information, since, the interviewer was able to probe for answers from the respondents and also able to clarify areas that were not understood well by the respondents. It enabled the researcher to clarify and elaborate the purpose of the research and effectively convince respondents about the importance of the research.

Relationship between Secondary School Principals' Management Styles and Teachers' Motivation

The objective of the study aimed at finding out the relationship between secondary school principals' management styles and teachers' motivation in the Western Region of Kenya. The outcome of data analysis is presented in the table below.

Mean of Teachers' Responses on the Relationship between Secondary School Principals' Management Styles and Teachers' Motivation

Variable	Poor	Fair	Good	Very good	Excellent
Teachers' Motivation	36.7	32.05	16.9	12.63	1.72

Source: Field Data (2017)

The table above gives the Mean of teachers’ responses on the effect of secondary schools’ principals’ management styles on teachers’ motivation. Averagely, 36.7% of the respondents indicated that the score on teachers’ motivation was poor, 32.05% was fair and only 16.9% was good. Qualitative analysis of this objective indicated that, principals’ management styles had a role in the motivation of teachers. Considering the responses from the participants, most of the attributes pointing to the teachers’ motivation were poor. This implies that the management styles used by secondary school principals impacted negatively on teachers’ motivation and hence impacted negatively on the teachers’ performance.

The study tested the relationship between principals’ management style and teachers’ motivation using inferential statistics and presented the results in the section below.

Correlation Analysis of Principals Management Style and Teachers’ Motivation

The study sought to determine the strength of the relationship between Principals’ Management Style and Teachers’ Motivation. The results are presented in Table 3.

Table 3: Coefficients’ Determination of Principals Management Style and Teachers’ Motivation

Model 1	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.701	.681		2.397	.013
Principals Management Style	.222	.123	.112	1.805	.072

a. Dependent Variable: Teacher motivation

Source: SPSS Output

Table 3 provides the information needed to predict teachers’ motivation from Principals’ Management Style. Both the constant and teachers’ motivation contribute significantly to the model. The regression equation was presented as follows;

$$Y = 1.701 + .222x$$

Where Y=Teachers’ motivation

x=Principals’ Management Style

This implies that teachers’ motivation explains 12.3% of the teachers’ performance when other factors were held constant.

Moreover, it is important for practising managers to understand the Maslow’s hierarchy of needs theory’s rigidity. Alternatively, managers ought to employ Alderfer’s ERG model which was introduced by Clayton Paul Alderfer as a modified version of Maslow’s theory of needs. In the ERG model, Alderfer presented three groups of core needs as : Existence; Relatedness and Growth (ERG). This model elaborates the concept that instead of starting with basic needs of satisfaction, one can work on all the three needs simultaneously without following or considering the traditional way to start with basic needs. Fro this new theory, it can be derived that a culture was a drawback of Maslow’s theory that was taken into consideration by ERG model.

The Model Summary of Principals’ Management Style and Teachers’ Motivation

The study obtained the model summary of teachers’ motivation and presented the results in the Table 4.

Table 4: Model Summary of Principals’ Management Style and Teachers’ Motivation

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.385 ^a	.148	.108	1.401

a. Predictors: (Constant), Teachers’ Motivation

Source: SPSS Output

The regression model in Table 4 shows the R and R² value representing the simple correlation. The R value was 0.385 which indicates a fairly strong correlation. The R² value indicates how much of the dependent variable (Teachers’ Motivation), can be explained by the independent variable (Principals’ Management Style). In this case, 14.8% can be explained. This therefore implies that there was a positive correlation between Principals’ Management Style and the teachers’ motivation.

ANOVA of Principals’ Management Style and Teacher Motivation

The study further sought to find out how Principals Management Style could predict Teacher Motivation. ANOVA analysis yielded the results in Table 4.21.

Table 5: ANOVA^a of Principals’ Management Style and Teachers’ Motivation

Model 1	Sum of Squares	df	Mean Square	F	Sig.
Regression	94.277	13	7.252	3.695	0.000 ^b
Residual	541.726	276	1.963		
Total	636.003	289			

a. Dependent Principals Management Style
 b. Predictors: (Constant), Teacher Motivation

Source: SPSS Output

The study meant to test whether there was any statistically significant relationship between principals’ management styles and teachers’ motivation in the Western Region of Kenya. The null hypothesis stated:

H₀₁: There is no statistically significant relationship between secondary school principals’ management styles and teachers’ motivation in the Western Region of Kenya.

In this study, any output of a probability value below 0.05, the null hypothesis will be rejected and the alternate hypothesis accepted.

ANOVA test was conducted and results in Table 4.21 indicate that the regression model predicts the outcome variable significantly. This indicates the statistical significance of the regression model that was applied with F statistic of 3.695 and a probability value of 0.000 that was below 0.05. Therefore, the null hypothesis was rejected and the alternate hypothesis accepted. The alternate hypothesis that stated there was a statistically significant relationship between secondary school principals’ management styles and teachers’ motivation in the Western Region of Kenya was true indicating on overall, the model applied can significantly predict the outcome variable.

IV. DISCUSSION

According to qualitative responses, most teachers do not like the management styles of their principals, which they claimed to be autocratic and insensitive to their needs. They indicated that principals who have been given a lot of autonomy by the Teachers' service Commission (TSC) and bears the final word for the school do not treat them with respect and with the required professional approaches but were mainly authoritative. Qualitative responses indicated that teacher's viewed their principals as harsh and with low regard to protocol when handling them, evinced by the practice of principals dealing with them directly instead of acting through the Heads of Department (HOD).

Majority of the respondent's views indicated that principals use coercion to ensure that teachers give in to their demand without questioning. This implies that most principals use the autocratic management style more than any other management styles. A study done by Abwalla, (2014) examined the principals' leadership style and teachers' performance in secondary schools of Gambella Regional state, Ethiopia revealed that democratic was the most practiced leadership styles in general secondary schools of Gambella region and that the teachers' performance was generally moderate. The study recommended that principals should neat a mixture of autocratic and democratic styles of leadership. A study done in Tanzania showed that the best performing schools in Morogoro and the Songea districts of the country used more democratic leadership style at (67%) of the cases compared to least performing schools (at 33%) while *laissez Faire* management style (at 25%), autocratic management style (at 25%) and democratic leadership style (at 50%) were the most dominant leadership styles (Machumu & Kaitila, 2014). These studies indicate the wisdom of adopting diverse leadership styles in a secondary education institution in order to achieve the desired goals.

V. CONCLUSION

The objective of the study aimed at finding out the relationship between secondary school principals' management styles and teachers' motivation. The study revealed that majority of teachers were not motivated to engage in class and also to mark books and exams scripts. The study further revealed that the majority of teachers were not motivated to discuss learner's performance on one to one with the student as well as not willing to discuss learner's behavior with parents. The study also revealed that the majority of teachers were not motivated to organize their working area and that the majority of teachers were not motivated to supervise learners and co-curricular activities.

The study further revealed that the majority of teachers were not motivated to visionary thinking and pursuit of purpose while a slight majority possess good self-esteem with an attitude of success. The study revealed that that majority of teachers were not motivated to work beyond expected time and majority were not motivated to effective management of time. Majority of teachers were poorly motivated to be optimistic about the school leadership and management. In addition to these, the majority of teachers were not motivated for voluntary participation in corporate social responsibility. Furthermore, the majority of teachers were not motivated to commit themselves beyond the call of duty for the school to meet the learners' needs. They only did what was indicated on the duty roster and nothing more. This clearly showed that the principals' management styles in application had a negative effect on the teachers' motivation to perform their duties.

The null hypothesis that stated: H03: There is no statistically significant relationship between secondary school principals' management styles and teachers' motivation in the Western Region of Kenya was rejected and the alternate hypothesis accepted because, the output of a probability value below 0.05.

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Effect of corporate governance on financial performance of Nepalese commercial banks

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Abstract- This study examines the impact of corporate governance on financial performance of Nepalese commercial banks. The return on assets (ROA) and return on equity (ROE) are the dependent variables. Women on board of director (WD), audit committee size (AS), firm size (FS), board size (BS), board independence (BI), foreign ownership (FO) and credit deposit ratio (CD) are the independent variables. The data are collected from the annual reports of selected commercial banks. Total of 23 commercial banks of Nepal are included in this study from 2012/13 to 2016/17 leading to a total of 115 observations. The regression and correlation models were estimated to test the significance and importance of corporate governance and performance of Nepalese commercial banks.

The findings shows that board independence has a significant negative relation on return on assets but insignificant negative impact on the return on equity. The credit deposit ratio also shows a significant negative impact on return on equity but insignificant negative relation with return on assets. Lastly, the firm size has insignificant positive impact on return on assets but a significant positive impact on return on equity.

Index Terms- Corporate governance, audit size, board independence, firm size, board size, women on board of director, credit deposit ratio, foreign ownership, return on assets, return on equity.

I. INTRODUCTION

Bank is the financial institution that accepts deposit from the public and creates credit. Bank collects money from surplus unit and provides it to deficit unit. It helps in the smooth flow of money from one sector to another. Banks and Financial institutions are classified according to BAFIA Act.

According to Nepal Rastra Bank commercial Banks are graded as 'A' class financial institution. Commercial bank is established to provide short term loan to traders so it is called commercial bank. But at present commercial bank has been providing loan to several sectors like agriculture, industry, trade, tourism, etc. It has been providing not only short term loan rather providing medium and long term loan. There are altogether 28 commercial bank in Nepal. Nepal Bank Limited is the first commercial bank of Nepal which was established on 1991 B.S. Nepal Rastra Bank was established on 2013/ 01/14 B.S. In 2022 BS, another commercial bank was established i.e. Rastriya Banijya Bank. Agricultural Development Bank was then established on 2024/10/07 to help the agriculture side of the

country. After liberalization policy, the first joint venture bank, Nepal Arab bank was established in 2041/03/29.

Corporate Governance refers to the management and control of the corporation which tries to reduce or eliminate the problems between the Principal- Agent. The principal delegates the rights to the manager to act in the best interest of the principal. Nepalese financial sector has yet to establish full good governance practices to become the more reliable and competitive sector of the economy. The board plays crucial role in corporate governance mechanism.

Corporate governance is the way power is exercised over corporate entities (Tricker, 2015). Cochran & Wartick (1988) defined corporate governance as "...an umbrella term that includes specific issues arising from interactions among senior management, shareholders, boards of directors and other corporate stakeholders". According to Lu & Batten (2001), corporate governance refers to the private and public institutions, including laws, regulations and accepted business practices, which together govern the relationship, in a market economy, between corporate managers and entrepreneurs (corporate insiders) on one hand, and those who invest resources in corporations, on the other". In recent years, the focus on corporate governance has increased due to the increased number of bankruptcies caused by fraud or errors in financial accounting. The reason behind those cases was the absence of corporate governance regulations in the organizations leading to the implementation of different accounting practices, increment in personal interest and biased reporting (Ioana & Mariana, 2014). Financial performance helps to measure how well organization is able to use its assets to generate the revenue. It helps to measure the firm's financial health over a given period of time. Financial performance is used by different analyst to compare the company's performance with other firms under same industry by analyzing the annual report like balance sheet, income statement, cashflow statement.

The main aim of this article is to identify the factors that have significant impact of corporate governance on financial performance.

II. REVIEW OF LITERATURE

According to Basel Committee on Banking Supervision (BCBS, 2005), corporate governance for banking organizations is arguably of greater importance than for other companies, given the crucial financial intermediation role of banks in an economy. Corporate governance in the banking system has assumed

heightened importance and has become an issue of global concern because it is required to lead to enhanced services and deepening of financial intermediation on the part of the banks and enables proper management of the operations of banks. To ensure this, both the board and management have key roles to play to ensure the institution of corporate governance (Nworji et al., 2011).

Fallatah & Dickins (2012) found that corporate governance and firm performance are unrelated. On the other hand, Ahmed and Hamdan (2015) found that corporate governance is significantly correlated with firm performance. Another different result was founded by Gupta & Sharma (2014), they found that corporate governance has limited impact on the firm's share prices and on its performance.

Corporate Governance is crucial to build a marketplace trust and attract investors in the corporation, as well as, corporate governance encourage investors' confidence by ensure the existence of independent board of directors. Moreover, it helps provide a high level of confidence degree which is very necessary for the whole market operation, as it considers adherence to business ethics principles (Guo & KGA, 2012).

Bhagat & Bolton (2008) found a negative relationship between board independence and operating performance. The overwhelming majority of work finds that having a more independent board of directors does not lead to better performance and may actually lead to worse performance. In contrary, Elloumi & Gueyié (2001) concluded that firms with high ratio of independent directors in a board face less frequent financial pressure. In addition, when a business environment worsens, firms with many independent directors have had lower probability of filing for bankruptcy (Daily et al., 2003).

Belkhir (2009) found a positive relationship between board size and performance. The study has provided evidence for theories predicting that smaller boards of directors are more effective, increasing the number of directors in banking firms does not undermine performance. In contrary, Lipton & Lorsch (1992) argued that due to co-ordination problems in larger boards and difference in regulation and control, larger boards are less effective than smaller boards.

According to Boudiab (2017), audit committee independence and meeting have a positive significant with the performance, but, the size of the audit committee has an insignificant relation with the performance. Therefore, study recommended reduction of size of audit committee.

Majumdar (1997) found that firm size and age of firms have a direct impact on firm-level productivity and profitability. The study also found that older firms are found to be more productive and less profitable, whereas the larger firms are, conversely, found to be more profitable and less productive.

As for the involvement of female directors in the firm performance, Green & Homroy (2018) represents a positive effect of board gender diversity on firm performance. In contrary, results of Pasaribu (2017) indicate that there is little evidence that female directors have a positive and strong relationship with firm performance.

Return on asset measures company's earnings in relation to all the funds it has at its disposal. It is believed better the governance model; more efficient would be the asset utilization. Return on Equity measures how much return is being generated by

the company on the money invested by the shareholders. It is one of the most important parameters for the investors in the company (Gupta & Sharma, 2014). Maher & Andersson (2002) found about effect of corporate governance followed by companies on their financial performance.

In the context Nepal, Pradhan (2014) found that board size has a positive and significant impact on ROA and ROE whereas the total assets and executive CEO have insignificant effect on ROE and ROA.

Acharya (2018) indicated that corporate governance structures, e.g. board size, existence of CFO, percentage of minority directors and the percentage of female directors have statistically positive effect on performance, while the percentage of external director has a negative impact on bank performance.

Sigdel & Koirala (2015) found a positive and significant role of classification policy of the central bank in promoting better governance.

In contrary, the result of Bhusal, et al. (2015) showed that there is an insignificant impact of corporate governance variables (Board Size, Firm Size and Ownership Structure) on ROA as well as ROE in Commercial Banks.

Lamichhane (2018) revealed that profit margin and return on assets of firms are positively related with age, market to book ratio and overall corporate governance index of Nepalese firms. Further, the regression result of the study showed that size of assets and debt ratio have negative effect and ownership concentration has no relationship with firms' financial performance.

The findings of Poudel & Hovey (2013) showed that bigger board and audit committee size and lower frequency of board meeting and lower proportion of institutional ownership led to better efficiency in the commercial banks.

Bhattarai (2017) revealed that audit committee and portion of independent directors have positive but board size has negative effect on financial performance of commercial banks in Nepal.

The above discussion reveals that there is no consistency in the findings of various studies concerning the effect of corporate governance on the performance of the firms. Therefore, this study has been conducted to examine the impact of corporate governance on the Nepalese commercial banks. Specifically, it examines the impact of board size, female directors, number of independent directors, size of audit committee, firm size and total credit to total deposit ratio (CDR) on financial performance (ROA and ROE) of Nepalese commercial banks.

The remainder of this study is organized as follows: section two describes the sample, data and methodology. Section three presents the empirical results and final section draws conclusion and discusses the implications of the study findings.

III. RESEARCH METHODOLOGY

This study is based on the secondary data which were gathered for 23 commercial banks. The main sources of data are Banking and Financial Statistics published by Nepal Rastra Bank and annual reports of the respective banks. These data were collected from 2012/13- 2016/17. Table 1 shows the number of commercial banks selected for the study along with study period and the number of observations.

	Name of commercial banks	Study period	Number of observations
1	Nabil Bank Limited	2012-2016	5
2	Standard Chartered Bank Nepal Limited	2012-2016	5
3	Laxmi Bank Limited	2012-2016	5
4	Machhapuchchhre Bank Limited	2012-2016	5
5	Everest Bank Limited	2012-2016	5
6	Kumari Bank Limited	2012-2016	5
7	Nepal SBI Bank Limited	2012-2016	5
8	Nepal Investment Bank Limited	2012-2016	5
9	Himalayan Bank Limited	2012-2016	5
10	Janata Bank Limited	2012-2016	5
11	Sunrise Bank Limited	2012-2016	5
12	Prime Commercial Bank Limited	2012-2016	5
13	Civil Bank Limited	2012-2016	5
14	Citizen Bank International Limited	2012-2016	5
15	Mega Bank Nepal Limited	2012-2016	5
16	Nepal Bangladesh Bank Limited	2012-2016	5
17	Century Commercial Bank Limited	2012-2016	5
18	NMB Bank Limited	2012-2016	5
19	Sanima Bank Limited	2012-2016	5
20	NIC ASIA Bank Limited	2012-2016	5
21	NCC Bank Limited	2012-2016	5
22	Prabhu Bank Limited	2012-2016	5
23	Siddhartha Bank Limited	2012-2016	5
	Total observations for banking enterprises		115

The model

The model estimated in this study assumes that the firm performance depends on several corporate governance variables. The corporate governance variables considered are board size, board independence, audit size, foreign ownership, women

directors, credit deposit ratio, and firm size. Therefore, the model takes the following form:

Firm performance = f (board size, board independence, audit size, foreign ownership, women directors, credit deposit ratio, and firm size)

More specifically,

$$ROA = \alpha + \beta_1 BS + \beta_2 BComp + \beta_3 AS + \beta_4 FO + \beta_5 WD + \beta_6 CD + \beta_7 FS + e$$

$$ROE = \alpha + \beta_1 BS + \beta_2 BComp + \beta_3 AS + \beta_4 FO + \beta_5 WD + \beta_6 CD + \beta_7 FS + e$$

Where,

ROA = Return on assets defined as net income to total assets, in percentage.

ROE = Return on equity defined as net income to total equity, in percentage

BS = Board size defined as total number of directors in the board
BComp = Board Independence (total number of independent directors on the board)

AS = Audit Size (total members in audit committee)

FO = Foreign ownership (defined as foreign investment to total equity capital, in percentage)

WD = Women on Board of Directors (Total number of women directors on the board)

Control variables

CD = Credit deposit ratio (the percentage of total credit to total deposits)

FS = Firm Size defined in terms of total assets, in millions of Rupees.

The following section describes the independent variables used in this study.

Board size

Board size is the total number of directors appointed in the board. The board of directors is highest body of company that is responsible for managing the firm and its operation. Lipton and Lorsch (1992), Jensen (1993), Yermack (1996), and Coles et al. (2008) found that smaller board size is associated with more success of the firms. However, Klein (1998), Dalton et al. (1999) found a negative relationship between board size and firm performance. Based on it, the study develops the following hypothesis.

H₁: There is positive relationship between board size and firm performance

Board independence

Board independence defined as the total number of professional directors in the board. Berghe and Baelden (2005) examined the issue of independence as an important factor in ensuring board effectiveness through the monitoring and strategic roles of the directors. Bhagat and Black (2002) found that firms with more independent boards do not perform better. Bhagat and Bolton (2008) found a negative relationship between board independence and firm performance. Bhagat and Bolton (2009) argued that having a more independent board of directors does not lead to better performance and may actually lead to worse performance. Hermanlin and Weibach (1991) found that there is

no relationship between board composition and firm performance. Based on it, the study develops the following hypothesis.

H₂: There is positive relationship between board independence and firm performance

Audit size

Audit firm size is highly associated with a greater level of disclosure. The audit committee can play a vital role in reducing information asymmetry between corporate managers and providers of finance as financial reporting is the most important mode of communicating the financial performance of a company to stakeholders (Dhaliwal et al., 2006; Krishnan, 2009). The studies of Kim et al. (2011) found that different sizes of audit firms do not significantly affect the audit quality. Bouaziz (2012) indicated that audit committee has an important impact on the financial performance of firms as measured by return on assets and return on equity. Farouk and Hassan (2014) found that auditor size and auditor independence have significant impacts on the financial performance of firms. Based on it, the study develops the following hypothesis.

H₃: There is negative relationship between audit size and firm performance

Foreign ownership

Foreign ownership or control of a business or natural resource in a country by individuals who are not citizens of that country or by companies whose headquarters outside that country. Boardman et al. (1997) found that foreign subsidiaries were more profitable and productive than their domestic counterparts. Kang and Stulz (1997) found that foreigners investing in Japan tend to underweight smaller and highly leveraged. Moreover, they found that holdings are relatively large in firms with large export sales. Gugler (1998) found significant and negative relationship between ownership concentration and profit margin. Barbosa and Louri (2005) found that ownership by foreign investors had a positive and significant effect on the profitability of firms. Douma et al. (2006) found that foreign firms performed better than domestic ones in terms of Return on assets (ROA) and Tobin's Q. Based on it, the study develops the following hypothesis.

H₄: There is positive relationship between board independence and firm performance

Women on board of directors

Women directors have the ability to connect and inspire well the company's women partners, even the women employees of the company to interact and work better. Lückerrath-Rovers (2013) affirmed the positive association of women members in the boardroom toward financial performance in particular and firm performance. Davies report (2012) found that there was a positive relationship between female directors and firm performance. However, Adams and Ferreira (2009) reported a negative association between female directors and firm performance. Haslam et al. (2010) reported that there was no association between the presence of female directors on a board and firm performance. Gregory-Smith et al. (2013) did not find evidence that the presence of females on boards is associated with higher firm performance. Based on it, the study develops the following hypothesis.

H₅: There is positive relationship between women director in board and firm performance

Credit deposit ratio

Credit-Deposit Ratio is the proportion of loan assets created by a bank from the deposits received. Pandya (2015) found that there exists statistically significant relationship between ROA. On the other hand ROE was found not to be statistically significant. However, Berger (1995) found evidence for a positive relationship between the ratios of capital to asset and returns on equity. Al-sabbagh, (2004) established the relationship between profitability and capital adequacy of commercial banks. Sharifi & Akhter (2016) found that the CDR impact positively on public sector bank's financial performance. Based on it, the study develops the following hypothesis.

H₆: There is positive relationship between credit deposit ratio and firm performance

Firm size

The size of an individual bank is measured by the total assets of the firms. The size is measured as natural logarithms of total assets. Devereux and Schiantarelli (1990), Athey and Laumas (1994) and Vogt (1994) found that large firms displayed higher investment-cash flow sensitivities. Roy (2008) explains that large banks can carry out a large number of different activities, so they can diversify their business portfolio and hence, credit risk will be decreased and performance will be increased. Pervan and Viši (2012) found that firm size has a significant (but weak) positive influence on firm profitability. Based on it, the study develops the following hypothesis.

H₇: There is positive relationship between firm size and firm performance

IV. DATA ANALYSIS

Descriptive statistics

Table 2 shows the descriptive statistics for the selected variables considered in this study. It clearly shows that the average return on assets has minimum value of -5.020 percent and a maximum of 4.890 percent, leading to the mean value of 1.576 percent and the average return on equity has minimum value of 3.850 percent and a maximum of 33.170 percent, leading to the mean value of 16.007 percent.

Table 2: Descriptive statistics

The table shows the descriptive statistics of dependent and independent variables. The dependent variables are return on assets (ROA, defined as net income to total assets, in percentage) and return on equity (ROE, defined as net income to total equity, in percentage), independent variables are women directors in board (WD, defined as number of women directors in company board), audit size (AS, defined as the total number of members in audit committee of the companies), firm size (FS, in terms of billions, defined as natural logarithms of total assets), board size (BS, defined as the total members in the company board), board independence, foreign ownership (FO, defined as the foreign investment to total equity capital, in percentage) and credit deposit ratio (CD, defined as total credit to total deposit, in percentage).

Variables	Minimum	Maximum	Mean	Std. Deviation
ROA	-5.020	4.890	1.576	0.917
ROE	3.850	33.170	16.006	6.006
BComp	0.000	3.000	1.643	0.975
BS	5.000	11.000	7.435	1.402
FS	5.827	256.545	53.313	34.273
AS	2.000	5.000	3.452	0.829
WD	0.000	2.000	0.261	0.514
FO	0.000	0.750	0.120	0.215
CD	48.920	186.630	81.007	16.435

Correlation analysis

Having indicated the descriptive statistics, the Pearson correlation coefficients have been computed for banking enterprises and results have been presented in the Table 3.

Table 3: Correlation matrix

The table shows the Pearson correlation coefficients amount different dependent and independent variables. The dependent variables are return on assets (ROA, defined as net income to total assets, in percentage) and return on equity (ROE, defined as net income to total equity, in percentage), independent variables are women directors in board (WD, defined as number of women directors in company board), audit size (AS, defined as the total number of members in audit committee of the companies), firm size (FS, defined as natural logarithms of total assets), board size (BS, defined as the total members in the company board), board independence, foreign ownership (FO, defined as the foreign investment to total equity capital, in percentage) and credit deposit ratio (CD, defined as total credit to total deposit, in percentage). The correlation coefficients are based on the 23 commercial banks with 115 observations for the period 2012/13 to 2016/17.

Vari ables	RO A	RO E	BS	W D	BC om p	FS	FO	C D	A S
RO A	1								
ROE	0.4 91**	1							
BS	- 0.2 68**	- 0.2 09*	1						
WD	0.0 32	- 0.1 74	- 0.1 46	1					
BCom p	- 0.2 59**	0.0 29	0.2 23*	0.0 65	1				
FS	0.1 03	0.3 35**	- 0.1 05	- 0.2 09*	- 0.1 03	1			
FO	0.3 16**	0.5 12**	- 0.2 37*	0.1 43	- 0.2 09*	0.2 84*	1		

CD	- 0.0 36	- 0.3 80**	0.1 56	- 0.0 62	- 0.0 38	- 0.2 13*	- 0.4 55*	1	
AS	0.0 34	0.0 10	0.2 29*	0.0 09	0.0 60	0.0 91	0.1 06	- 0. 13 9	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at 1 percent and 5 percent levels respectively.

The result shows that there is positive relationship of woman on board with return on assets which indicates that higher the number of woman on board of directors, higher would be the return on assets. However, the study observed negative relationship between women on board of directors with return on equity indicating that increase in woman on board of directors leads to decrease in return on equity. There is positive relationship of size of audit committee with return on assets and return on equity which reveals that larger the number of audit committee, higher would be return on assets and return on equity. Similarly, credit deposit ratio has negative relationship with the return on assets and return on equity which reveals that an increase in credit deposit ratio leads to decrease in return on assets and return on equity.

Similarly, firm size has positive relationship with return on assets and return on equity indicating that increase in firm size leads to increase in return on assets and return on equity. Similarly, board size has negative relationship with return on assets and return on equity, which reveals that increase in board size leads to decrease in return on return on assets and return on equity. There is positive relationship between numbers of board independence return on equity which reveals that higher the number of independent directors, higher would be the return on equity. However, a negative relationship has been observed between the independent directors and return on assets. There is positive relationship of foreign ownership with return on assets and return on equity which reveals that increase in percentage of foreign ownership leads to higher return on assets and return on equity.

Regression analysis

Taking the indicated Pearson correlation coefficients, the regression analysis has been carried out and the results are presented in Table 4. More precisely, the table shows the regression results of Women on Board of Directors, audit size, firm size, board size, Board independence, foreign ownership and credit deposit ratio on return on assets for Nepalese commercial banks.

Table 4: Estimated regression results of women on board of directors, audit size, firm size, board size, Board independence, foreign ownership and credit deposit ratio on return on assets

The results are based on panel data of 23 commercial banks with 115 observations for the period of 2012/13 to 2016/17 by using linear regression model. The model is $ROA = \alpha + \beta_1 BS + \beta_2 BComp + \beta_3 AS + \beta_4 FO + \beta_5 WD + \beta_6 CD + \beta_7 FS + e$, where the dependent variable is return on assets (ROA, defined as net

income to total assets, in percentage) and the independent variables are women directors in board (WD, defined as number of women directors in company board), audit size (AS, defined as the total number of members in audit committee of the companies), firm size (FS, defined as natural logarithms of total assets), board

size (BS, defined as the total members in the company board), board independence, foreign ownership (FO, defined as the foreign investment to total equity capital, in percentage) and credit deposit ratio (CD, defined as total credit to total deposit, in percentage).

ROA	Mode	Intercept	Regression Coefficients										
			WD	AS	BS	BComp	FO	CD	FS	Adj R ²	SEE	F-statistics	
	1	1.562 (16.198) **	0.057 (0.337)								.008	.922	0.114
	2	1.448 (3.921) **		0.037 (0.360)							.008	.921	0.130
	3	2.879 (6.415) **			-0.175 (2.952) **						.063	.888	8.715
	4	1.977 (12.054) **			-0.244 (2.843) **						.059	.894	8.080
	5	1.415 (15.139) **				0.013 (3.546) **					.092	.874	12.576
	6	1.724 (4.014) **						-0.002 (0.388)			.008	.921	0.151
	7	-0.478 (0.317)							0.192 (1.366)		.008	.914	1.866
	8	1.413 (4.014) **		0.000 (0.005)		0.013 (3.510) **					.084	.878	6.232
	9	2.888 (6.229) **	-0.014 (0.083)		-0.176 (2.920) **						.055	.892	4.323
	10	2.186 (4.842) **			-0.246 (2.849) **			-0.003 (0.498)			.053	.897	4.137
	11	3.035 (5.314) **			-0.146 (2.351) *	-0.197 (2.256) *			-0.001 (0.118)		.090	.879	4.713

12	1.211 (2.284) *				-0.177 (2.062) *	0.014 (3.202) **	0.006 (1.070)		.125	.862	6.405
13	0.922 (0.532)	0.086 (0.102)	0.133 (2.087) *	-	-0.150 (1.713)	0.012 (2.506) **	0.008 (1.361)	0.078 (0.538)	.139	.855	4.051

Note: The asterisk signs (**) and (*) indicate that the results are significant at 1 percent and 5 percent levels respectively.

The result shows that the beta coefficients for women director in BOD are positive with return on assets. It indicates that women director in BOD has positive impact on return on assets. This finding is similar to the findings of Luckerath-Rovers (2013). However, the beta coefficients for audit size are positive with return on assets. It indicates that audit size has a positive impact on return on assets. This finding contradicts with the findings of Dhaliwal et al. (2006); Krishnan & Ramachandran (2009). The beta coefficients for board size are negative with return on assets. It indicates that larger board size has negative impact on return on assets. This finding is consistent with the findings of Coles et al. (2008). Likewise, the beta coefficients of board independence are negative with return on assets. It indicates that board independence has negative impact on return on assets. This finding is contrary with the findings of Berge & Baelden (2005) but is consistent with Bhagat & Bolton (2008), who found a negative relationship between board independence and operating performance.

The results show that the beta coefficients for foreign ownership are positive with return on assets. It indicates that foreign ownership has positive impact on return on assets. The results are similar with Kang & Stulz (1997). The results show that the beta coefficients for credit deposit ratio are negative with return on assets. It indicates that credit deposit ratio has negative impact on return on assets which is contrary to the findings of RBI (2015); Singh & Tandon (2012). The results also show that the beta coefficients for firm size are positive with return on assets. It indicates that firm size has positive impact on return on assets which is similar with the findings of Devereux & Schiantarelli (1990), Athey & Laumas (1994) and Vogt (1994).

Table 5 shows the regression results of women directors on board, audit size, firm size, board size, board independence, foreign ownership and credit deposit ratio on return on equity for Nepalese commercial banks.

Table 5: Estimated regression results of women on board of directors, audit size, firm size, board size, Board independence, foreign ownership and credit deposit ratio on return on equity

The results are based on panel data of 23 commercial banks with 115 observations for the period of 2012/13 to 2016/17 by using linear regression model. The model is $ROE = \alpha + \beta_1 BS + \beta_2 BComp + \beta_3 AS + \beta_4 FO + \beta_5 WD + \beta_6 CD + \beta_7 FS + e$, where the dependent variable is return on equity (ROE, defined as net income to total equity, in percentage) and the independent variables are women directors in board (WD, defined as number of women directors in company board), audit size (AS, defined as the total number of members in audit committee of the companies),

firm size (FS, defined as natural logarithms of total assets), board size (BS, defined as the total members in the company board), board independence, foreign ownership (FO, defined as the foreign investment to total equity capital, in percentage) and credit deposit ratio (CD, defined as total credit to total deposit, in percentage).

R O E	M o d e l	Int erc e p t	Regression Coefficients							F- v a l u e		
			W D	A S	B S	B C o m p	F O	C D	F S		R ²	S E
	1	16.537 (26.0) **	-2.034 (1.881)								5.93	3.538
	2	15.79 (6.516) **		0.075 (0.110)							6.033	0.012
	3	22.65 (7.605) **			-0.896 (2.273) *						5.89	5.816
	4	15.71 (14.146) **			0.174 (0.298)						6.058	0.089
	5	14.29 (14.2) **				0.143					5.21	0.011

	(25 .81 1) **				(6. 34 0) **		5 6	8 1	9 5
6	27. 25 0 (10 .36 8) **				- 0. 13 9 (4. 36 5) **		. 1 3 7	5. 5 8 1	1 9. 0 5 3
7	- 37. 22 9 (4. 33 9) **					4. 97 3 (6 .2 14) **	. 2 4 8	5. 2 0 8	3 8. 6 1 6
8	20. 05 7 (7. 07 1) **				0. 11 9 (4. 78 6) **	0. 06 8 (2. 07 1) *	. 2 7 7	5. 1 0 8	2 2. 8 2 8
9	- 21. 87 1 (2. 26 7) *				- 0. 09 3 (3. 09 5) **	4. 23 9 (5 .2 53) **	. 3 0 1	5. 0 2 1	2 5. 6 4
10	17. 32 3 (6. 26 1) **		- 0. 39 8 (1. 11 8)		0. 13 7 (5. 90 1) **		. 2 5 7 7	5. 1 7 6	2 0. 7 6 7
11	28. 21 9 (10 .80 2) **	- 2. 31 7 (2. 30 2) *			- 0. 14 3 (4. 58 8) **		. 1 6 9	5. 4 7 5	1 2. 5 8 6
12	15. 38 5 (7. 38 4) **	- 0. 32 1 (0. 54 4)			0. 14 4 (6. 34 2) **		. 2 5 1	5. 1 9 8	2 0. 1 2 0

		- 2. 39	- 0.	- 0.	0. 0.	0. 11	- 0.	2. 60 0			
13	5.5 16 (0. 55 3) **	2 (2. 60 1) **	30 7 (0. 55 4)	52 0 (1. 48 6)	84 7 (1. 75 9)	0 (4. 32 5) **	0 3 (1. 39 7) **	(3 .1 41) **	. 4 0 8	4. 6 4 0	1 2. 1 3 5

Note: The asterisk signs (**) and (*) indicate that the results are significant at 1 percent and 5 percent levels, respectively.

4. The result shows that the beta coefficients for women director in BOD are negative with return on equity. It indicates that women director in BOD has negative impact on return on equity. This finding is contradictory with the findings of Lückerath-Rovers (2013). However, the beta coefficients for audit size are positive with return on equity. It indicates that audit size has a positive impact on return on equity. This finding contradicts with the findings of Dhaliwal et al. (2006); Krishnan & Ramachandran (2009). Likewise, the beta coefficients for board size are negative with return on equity. It indicates that larger board size has negative impact on return on equity. This finding is consistent with the findings of Coles et al. (2008). In contrary, Lipton & Lorsch (1992) suggests that due to co-ordination problems in larger boards and difference in regulation and control, larger boards are less effective than smaller boards. Likewise, the beta coefficients of board independence are positive with return on equity. It indicates that board independence has positive impact on return on equity. This finding is consistent with the findings of Berghe & Baelden (2005). The results show that the beta coefficients for foreign ownership are positive with return on equity. It indicates that foreign ownership has positive impact on return on equity which is consistent finding of Kang & Stulz (1997). The results show that the beta coefficients for credit deposit ratio are negative with return on equity. It indicates that credit deposit ratio has negative impact on return on equity which is contradictory to the finding of RBI (2015); Singh & Tandon (2012). The results also show that the beta coefficients for firm size are positive with return on equity. It indicates that firm size has positive impact on return on equity which is consistent with the findings of Devereux & Schiantarelli (1990), Athey & Laumas (1994) and Vogt (1994).

V. SUMMARY AND CONCLUSION

Banks today are the largest financial institutions around the world, with branches and subsidiaries throughout everyone's life. However, commercial banks are facing risks when they are operating. Credit risk is one of the most significant risks that banks face, considering that granting credit is one of the main sources of income in commercial banks. Therefore, the management of the risk related to that credit affects the profitability of the banks.

This study aims at determining the effects of corporate governance on performance of Nepalese commercial banks. It is based on the secondary data of 23 commercial banks with 115 observations for the period of 2012 to 2016. As initial approximation to the theory, this study hypothesized that the commercial banks performance depends on several corporate governance and control variables such as Board size, audit size, board independence, women directors, foreign ownership, credit deposit ratio and firm size. The study of banking enterprises revealed that average female director is 0.261 while average audit size is 3.452. The average credit deposit ratio is 81.007 percent and average firm size is Rs. 53313.262 million. Similarly, average board size, number of independent directors and foreign ownership is 7.435 persons, 1.643 persons and 0.120 respectively.

The result shows that credit deposit ratio is negatively related to return on assets and return on equity. It means higher the credit deposit ratio; lower would be the return on assets and return on equity respectively. Similarly, the board size is negatively related with return on assets and return on equity. It means that higher the board size, lower would be the return on assets and return on equity respectively. Similarly, audit size is positively related to return on assets and return on equity respectively. The firm size is positively related to return on assets and return on equity. Women on board of director have positive relationship on return on assets and negative relation with return on equity. Board independence has negative relationship with return on assets and positive relation on return on equity. Foreign ownership has positive relationship with return on assets and on return on equity. The study shows that women on BOD, audit size, foreign ownership, and firm size have positive impact on return on assets of Nepalese commercial banks. However, bank size, board independence and credit deposit ratio have negative impact on return on assets of Nepalese commercial banks. The study concludes that board size, board independence and foreign ownership have 5% significant impact on the return on assets of Nepalese commercial banks.

The study shows that audit size, foreign ownership, board independence and firm size have positive impact on return on equity of Nepalese commercial banks. However, women in BOD, bank size, and credit deposit ratio have negative impact on return on equity. The study concludes that board size has 1% significant impact on the return on equity of Nepalese commercial banks. The study concludes that foreign ownership, credit deposit ratio and firm size have 5% significant impact on return on equity of Nepalese commercial banks.

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Consumer's Attitude Towards Global Luxury Car Brand Purchase Intention: Development of a Conceptual Model

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Abstract- The consumption of luxury brands is influenced by a number of factors such as consumers' attitude, identity, personality, mindset, values, social influence and financial power, etc. Researchers have conducted a number of scholarly studies on consumption of luxury brands in rich Western countries, and have analyzed the behavioral outcomes of consumers in terms of hedonism, prestige, uniqueness, quality, and conspicuous consumption. However, little research has been conducted on the consumer behavior of luxury consumption in emerging countries, such as Sri Lanka. As a consequence of globalization, Sri Lanka today has an emerging wealthy class of consumers that wish to enjoy the luxurious living of the Westernized rich, including the ownership of luxury car brands such as Bentley, Porsche, Ranger Rover, etc. Using Sri Lanka as a test case, this paper proposes a new conceptual model that could be applied to the study of consumption of luxury brands across emerging markets to determine the consumer attitude towards luxury.

Index Terms- Luxury brands, brand love, brand consciousness, consumer attitude, lifestyle, brand identity, Sri Lanka, self-identity, social value, experiential value

I. INTRODUCTION

Marketers have often sought to learn the characteristics of particular consumers and to understand their attitudes toward brands. A few studies have considered automobile purchasing behavior in emerging markets (Sedzro, et. al., 2014). According to (Wiedmann, Hennigs, & Siebels, 2007) understanding the consumer perceptions and culture is a challenge for the brand marketers. The consumer attitude towards the purchase of luxury brands has a positive correlation with the purchase intention (Sharda, & Bhat, 2018). Luxury brands have started to stream into Asian markets to chase the new wealthy consumers that are emerging in countries such as Sri Lanka and Asian markets, especially China has played a greater role in the global consumption for luxury (Koch & Mkhitarayan, 2015). Consumers associate the concept of luxury with terms such as: upscale, great taste, high quality, high class, etc. Consumers do satisfy their utilitarian necessities through luxury brands, but Dubois, Laurent, & Czellar, (2001) discussed social and psychological restraints that have existed in societies as long ago

as in ancient Greece. According to Shukla (2011) compared with the Europe, the consumers in Asia have exhibited subjective influence of the individual with greater brand love towards luxury brands.

Vigneron and Johnson (1999) proposed five main factors that influence consumers' decision making for luxury brands; conspicuousness, uniqueness, social (bandwagon appeal), emotional (hedonism), and quality. Most researchers do concur that recognition of luxury exists on two distinctive dimensions: the individual situation and the general population (Campbell, 1987). Wiedmann, Hennigs, and Siebels (2007) described that the luxury value has three fundamental dimensions and they are functional value, social value and individual value. Studies by Elinder (1961), Levitt (1988), Fatt (1964) and Roostal (1963) have shown that because of the similarity of the segments across countries, globalized brand consumption can occur in different cultures through standardized communications. Product classes such as luxury cars, fashion, leather accessories, jewelry, etc. have shown similarity in appeal to consumer segments from different cultural backgrounds across countries (Dawar & Parker, 1994).

Sri Lanka is a rapidly developing country in the south Asian region. The Sri Lankan government has made significant efforts to attract foreign direct investment for number of development projects. This economic development has given Sri Lankan consumers new optimism and they are becoming more conscious about their living conditions. Increased education has also expanded consumerism in Sri Lanka, as its citizens have become more familiar with how other consumers live throughout the world. As the economy grows, so do imports (Arif, et. al., 2017). With its new hope and economic prosperity, and positive trajectory, many multinational corporations are considering to enter into Sri Lankan market. Because of the rapidly changing consumer profiles of these developing countries, there is a need to explore the perceptions and attitudes of luxury buying brand purchasing behavior in these markets (Roy, Jain, & Matta 2018). The appreciation of global luxury brands has been affected by globalization and greater multicultural interactions (Jiang et al., 2014). Despite the amount of abundant research conducted on luxury branding, there is a significant dearth of research on the actual buying behavior and thought process of individual consumers buying luxury brands (Miller and Mills, 2012). Consumer identity plays a big role as a stimulus in creating a

psychological or mental structure in consumers' minds regarding luxury brands (Roy, Jain, & Matta 2018).

II. RESEARCH PROBLEM

Jain, Roy and Ranchhod (2015) suggested that the changing profiles of the Asian consumer have significantly affected the inflow of luxury brands to South Asian countries. Several studies have fathomed the influence of a country's culture and demographics on luxury brand consumption (Hung *et al.*, 2011; Godey *et al.*, 2013). According to Oswald (2010) the perception of luxury brands and the meaning tied to these brand images are quite different in emerging markets than they are in the Western markets where many of these brands originate. However, Hennings *et al.*, (2012) showed that regardless of country, consumers of luxury brands had similar basic motivational drivers. Although research has been conducted into luxury branding from the view of the retailer (Fiondaan & Moore, 2009) (Miller and Mills, 2012; Ghosh and Varshney, 2013), dearth of research could be found about consumer's attitude towards luxury automobiles from Asian perspectives. Camilo and Davit (2015) found that Chinese consumers tend to expect specific benefits (safety, quality, design, and technology) from luxury car brands.

Even though there is substantial research carried out in the history of luxury literature, consumer research on the attitudes towards luxury is scarce (Dubois *et al.*, 2005; Shukla, 2012). The consumer attitude towards the purchase of luxury brands has a positive correlation with the purchase intention (Sharda, & Bhat, 2018). Therefore, it is important to develop a comprehensive understanding of the determinants of consumers' attitude toward luxury brand consumption to understand how their intrinsic motivations and attitude towards luxury brands differ by culture and what shapes those differences (Bian and Forsythe, 2012).

III. LITERATURE REVIEW

Luxury is a concept which is very difficult to be defined and it is based on subjective judgements that could lead for different definitions (Vigneron and Johnson, 1999); Yeoman, 2011). Luxury is an ambiguous concept (Dubois, Laurent & Czellar 2001). This ambiguity is related to the abstract and symbolic nature of luxury (Roux & Boush 1996). Therefore, to understand luxury, it is important to understand the dimensions of luxury and the consumer attitude towards luxury. The Brand Luxury Index (BLI) scale developed by previous researchers: Vigneron and Johnson (2004), Kim (2012), Kim and Johnson (2015) is widely accepted in research on luxury to measure the consumer attitudes to evaluate the global luxury car brands.

Husic and Cicic (2009) found that consumer demand for luxury brands is increasing in many countries as consumers acquire more income and seek more consumption opportunities. In addition, emerging markets have a growing demand for luxury brands, which is mainly influenced by middle-class consumers (Hodgson, 2015 & Kapferer, 1998). These markets are characterized by a strong desire for status (Deloitte, 2014 & Kapferer, 1998).

Hauck and Stanforth (2007) defined luxury as non-necessities, or something that is more than needed for survival.

This broad definition of luxury describes the introduction of luxury brands into the middle classes. This movement of the concept of luxury down the class structure has led to significant growth in the market for luxury brands (Savitha & Sathyanarayan, 2014). Weidman *et al.*, (2009) proposed four main dimensions of luxury. These dimensions are financial, functional, individual, and social. The financial dimension measures the monetary value of luxury, whereas the functional dimension is identified as basic benefit and its utilities. The customer's personal orientation towards luxury forms the individual dimension, and the social dimension is identified as the perceived utility of luxury consumption as recognized by the society.

There has been a significant increase in the number of millionaires thanks to the success of globalization throughout the world and with it has come an expansion in the market for luxury brands (De Barnier and Rodina, 2006; Husic and Cicic, 2009; Wiedmann, Hennigs and Siebels, 2007). Despite the fact that there is such growth in the industry, the number of studies specific to luxury vehicles are minimal. At the same time, automobile manufacturers have broadened their product lines by offering an appealing experience to a many upper-class consumers across the world.

With the growth of consumerism, a large number of consumers who did not previously have access to luxury brands now feel that they have a right to access this luxury (Dubois and Laurent, 1996). In particular, the expanding sales of luxury car brands has highlighted their need to manage customer perceptions of new groups of consumers. This has added to the challenge of expanding sales to a new segment of society while maintaining the differentiation of the luxury car brand. Further, in comparison to the non-luxury automobile brands, consumer attitude plays a significant role in shaping the consumer desire for luxury car brands, which itself is driven by consumer intangibles such as psychological rewards (Vicker & Renand, 2003).

Consumers describe the term luxury with different expressions that show nuanced meanings such as upscale, great in taste, quality, class, etc. These expressions show that consumers fulfill their psychological needs through luxury, but meeting utilitarian needs is still an important component of many luxury purchases (Dubois, Laurent and Czellar, 2001; Vigneron and Johnson, 1999). Hanzee and Teimourpour (2012), showed that luxury is viewed from the consumer perspective in terms of their various feelings about the brand as well as the products' physical qualities. An important aspect of luxury brands is that as income levels rise, consumers spend more of their money on luxury brands (Songer, 2014). However, high value brands tend to follow a standard brand positioning regardless of the market (Rajagopal, 2009). Keller (1993) argues that brand value depends on three main components: attributes, benefits, and attitudes. Attributes refers to the product or service itself, its price, and the process of buying and consuming the item. Benefits denotes what consumers think that the product or service can ultimately do for their favor. Attitude refers to consumers' overall impression of the brand of a product or service. Percy and Rossiter (1992) created a model of a buyer's attitude, which has four main characteristics: 1) Attitude is based upon the current motivation, which can, of course, change. 2) There are both cognitive (logical) and affective (emotional) elements. The cognitive component decides the direction of the behavior and the affective component provides

impetus for the behavior. 3) The cognitive portion consists of specific beliefs related to benefits. 4) The attitude construct is dependent upon the choices available. Buyers select brands based on those that best meet their motivations from among the options that they perceive.

Dubois, et al. (2001), found that consumers' perception towards luxury brand varies considerably with some having strong positive feelings and others having negative ones. Wiedmann et al., (2007) in their conceptual model of luxury consumption behavior, which includes the dimensions of financial value, social value and functional value, the overall evaluation of the luxury of an item is the total of the assessments of the individual dimensions. Further, these individual dimensions are influenced by local culture. Hennigs, Wiedmann, Klarmann, and Behrens (2015) described the purchasing behavioral outcome as intention to buy, willingness to pay a price premium and willingness to recommend. Purchase behavior of the luxury brand users is assessed by willingness to recommend, buying intention, and willingness to pay a price premium.

Conspicuousness, uniqueness, quality, hedonism, and extended-self were identified as dimensions of luxury (Vigneron & Johnson, 1999/2004; Eng & Bogaert, 2010; Ghanei, 2013) and Brand Luxury Index (BLI) was developed by Vigneron and Johnson (1999/2004). Wiedmann et al., (2007) proposed four latent dimensions for luxury perception such as financial, functional, individual and social dimensions. Among the antecedent constructs of the first order latent variables, conspicuousness value, self-identity value, materialism and hedonism values have been used in this study. In addition to that, uniqueness value has been adopted to the model as unique experience whereas usability value has been taken as utilitarian value. These elements of luxury had strong correlation towards the behavioural outcomes of luxury brand consumption. Hennigs et al., (2015) found that financial, functional and social dimensions of luxury significantly influence the individual value of luxury perception. Among the elements that encompassed the individual value of luxury such as Experiential value, materialistic value, hedonism and sensory pleasure, this study has taken them into consideration in developing the theoretical model.

The perceived luxury dimensions were further revised by Kim and Johnson (2015) proposed quality, extended-self, hedonism, accessibility, and tradition as luxury dimensions. A large number of scales have been discussed in literature (Kapferer, 1998; Vigneron and Johnson, 1999; Dubois et al, 2001, Beverald, 2005; Wiedmann et al., 2012, Hennigs et al., 2015). However, the abundance of these scales has not been adequate to help understanding the rapid growth of the luxury market (Kapferer & Florence, 2016). Further, Kapferer and Florence (2016) stated that the addition of 'financial value' to the luxury model developed by Wiedmann et al., (2009) remained awkward as luxury brands are inevitably priced very high. Further they argued that Wiedmann et al., (2009) and Hennigs et al., (2012) focus on the scale more on to the individual differences rather than luxury brands themselves. Hence, it does not help the luxury brand managers to examine what levels they should stimulate in order to sustain luxury brands.

Proposed Conceptual Model

Reviewing the literature critically, the proposed conceptual framework is presented in Figure 1. Perceived Luxury

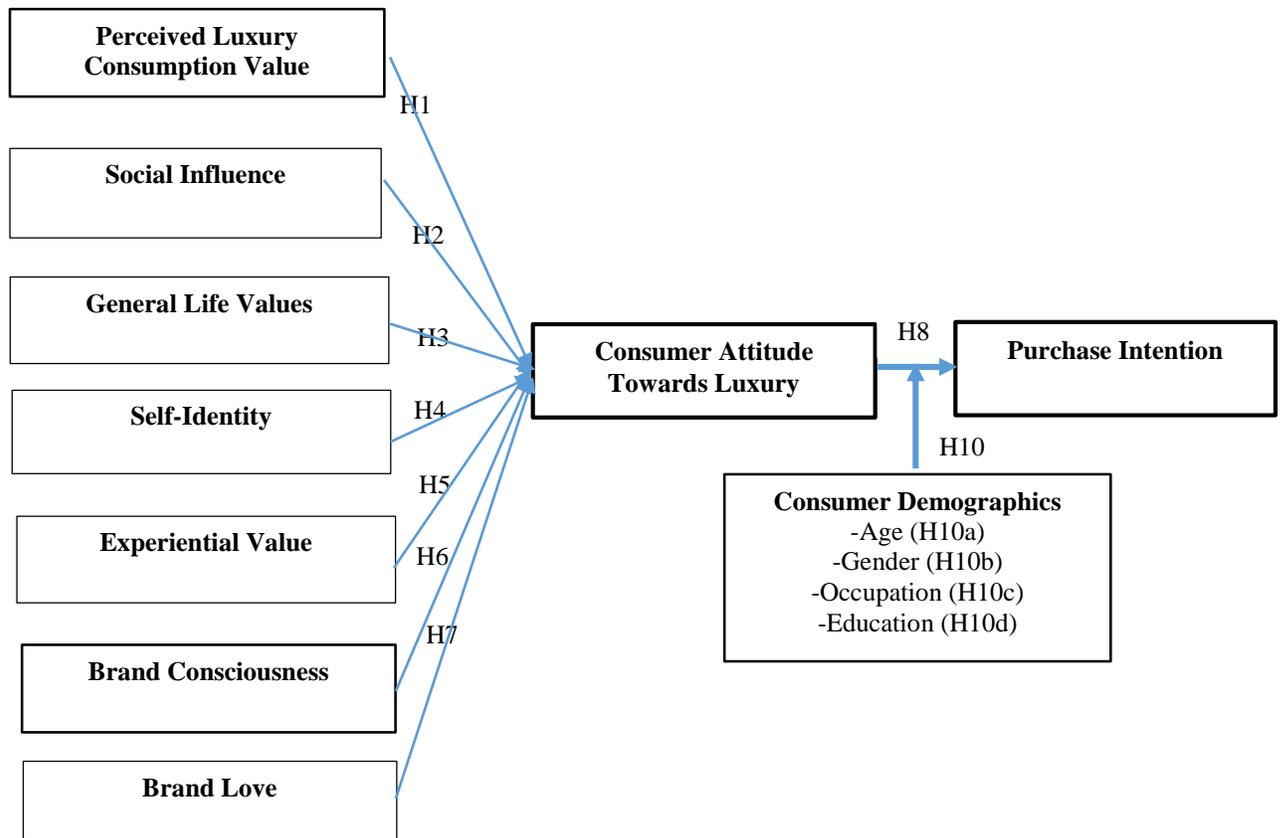
Consumption Value, Social influence, General Life Values, Self-Identity, Experiential value, Brand Consciousness and Brand Love are identified as independent variables. Consumer attitude towards luxury cars is recognized as the mediating variable. Whereas the Purchase Intention is established as the dependent variable.

When the evolution of luxury concept and the consumer behavioural theories are concerned, the theory of planned behavior which is traditionally explained for behavior, not for the product, has been used to develop the conceptual model. In our study, the research is conducted for a particular type of product, global luxury cars. Therefore, there are unique things that are required and responsible for formation of attitude. That is the research gap addressed in this study.

The perceived luxury consumption value dimensions were further revised by Kim and Johnson (2015) proposed quality, extended-self, hedonism, accessibility, and tradition as luxury dimensions. In order to expand its managerial applications, experiential value has been added to the proposed conceptual model developed for this research. Further, it is agreed that luxury today need to deliver feelings of privilege, exclusivity, pleasure and uniqueness (Godey et al., 2013). Visual appeal, entertainment value, escapism, intrinsic enjoyment, efficiency, economic value, excellence, retail preference and future patronage intent have been identified to measure the experiential value in luxury consumption (Mathwick, Malhotra, & Rigdon, 2001). According to Lawry et al., (2010) self-identity values are used by consumers in order to assess the consumer's perceived level of congruence between the luxury goods and self-image or desired image. According to Bagozzi, Batra, and Ahuvia (2014), the scale of measurements has been used to measure the current self-identity and the desired self-identity. Referring the work of Tynan et al.'s (2010) a five-factor luxury measurement model was developed by Shukla and Purani (2012) with the variables such as utilitarian, self-directed symbolic, hedonic, other-directed symbolic and cost. According to Shukla (2011) the social value of the consumer purchase of luxury is reflected by the perceived value of consumer towards luxury when compared with the social group within which the consumer associates and the reference group. The researchers (Berthnal, Crockett and Rose, 2005; Van Kempen, 2003) describe the consumers' desire to exhibit social status under the studies conducted on conspicuous consumption. Leibenstein (1950) and Vigneron and Johnson (1999) explain that luxury has been traditionally focused on pursuing the status symbol. This implies that the consumers who want to consume these luxury products need to provide information about themselves to the society. Brand Love is the relationship between the brand and the consumer in which the consumer has a positive attitude towards the brand (Batra et al., 2012). Brand love has been recognized as a new marketing concept among scholars who attempt to study the consumer's relationship with brands (Kaufmann et al., 2016; Vernuccio et al., 2015). Attitude towards Luxury can be measured as the perceived level of luxury of a brand by consumers (Vigneron & Johnson, 2004). Nobre (2011) found that relationship with a brand was strongest for products that have high consumer involvement, such as automobiles. Luxury brand consciousness is defined as the consumer's predisposition towards the purchase of famous luxury brands (Sproles & Kendall, 1986; Zhang & Kim, 2013). Thus, brand consciousness creates a favorable attitude towards luxury brands and special bonds between consumer and

the luxury brand. Purchase intention reflects the outcome of a consumer's attitudes and is important in the context of brand consumption behavior (Ajzen, 1991; Berthon et al., 2009; Hung et al., 2011; Jin & Kang, 2011). Closely related to this is the re-purchase intention, which is influenced by the positive emotions of the consumer pertaining to a luxury brand (Thomson et al., 2005; Carroll and Ahuvia, 2006; Batra et al., 2012; Loureiro et al., 2012).

Conceptual Model



DISCUSSION, CONCLUSIONS AND MANAGERIAL IMPLICATIONS

Global luxury spending has increased significantly and it is expected to reach USD 40 trillion annually by the year 2020. Previous research studies conducted have emphasized the role of a country's culture and its demographical factors on luxury brand consumption (Hung *et al.*, 2011; Godey *et al.*, 2013). As Miller and Mills (2012) suggested, the very meaning of luxury could vary from country to country because of socio-cultural and economic differences. Consumer motivations and their objectives which are behind the luxury purchase could be broadly similar (Hennigs *et al.*, 2012), but luxury value is a complex construct and the effects of the perceptions of the individual on consumer behavioral outcomes have neither been fully explored nor thoroughly understood (Shukla, 2011; Tynan *et al.*, 2010; Vigneron & Johnson, 2004; Wiedmann *et al.*, 2009; Hagtvedt & Patrick, 2009). The proposed model in this paper used to examine the consumer attitude towards luxury in another country setting and will be valuable for luxury automobile car manufacturers as it will impact in three ways: 1) Identifying affordable target segments 2) Developing promotional campaigns, and 3) Determining which brands to sell in the market or to develop cars ideal for market.

Identifying the target market is not about finding the richest one percent of the population and advertising to them. As the economy grows, so does the percentage of consumers that can afford luxury cars. As these new groups of consumers are capable of purchasing luxury cars it is important to understand who is truly interested in such purchases. A proper understanding of these potential consumers of luxury cars can inform the efforts of car firms as they seek new market segments for their brands.

Cultural differences create major variations in the perceptions and acceptance of luxury brands from county to country. Using a successful promotional campaign from one region of the world may fail in another because of these cultural differences. By identifying and understanding these cultural differences; companies can develop promotional campaigns that resonate with the key factors that would influence the aspirants of luxury, and thus be more successful than merely translating a campaign used elsewhere.

Therefore, a firm must be selective when deciding which cars to introduce to the market. A thorough understanding of the market will enable a company to review its set of offerings and consider which market might enjoy the best success. A car firm may even find that a new product might better serve this markets and thus enjoy greater success than would not be possible without this study.

Although this study will focus on luxury cars, the information gained about the motivations, values, attitudes and purchase intentions luxury car aspirants it could be generalized to other luxury brands. Companies that seek to sell luxury brands in South Asia will benefit from the results of this study as they design and position their brands for this market.

With an understanding of the interactions proposed in this model, future research could look how these factors manifest in other luxury products. Indeed, many products that might be considered common to one segment could be considered luxury to another and this model could inform a shift in developing and promoting a wide range of products besides luxury cars.

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Emotional Intelligence And Its Relationship To Emotional Literacy Strategies Of The Teachers Of Jones Rural School

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Abstract: This study aimed to explore and identify the relationship of emotional intelligence to the emotional literacy strategies of teachers of Jones Rural School. The researcher used a total population sampling at 95% confidence level and 5% margin of error to select 79 respondents. A descriptive correlation method of research was utilized. Data were gathered using questionnaire divided into three parts: personal information, emotional intelligence, and emotional literacy strategies. The researcher patterned the questionnaire from the study “Emotional Literacy in EFL Classes: The Relationship between Teachers' Trait Emotional Intelligence Level and the Use of Emotional Literacy Strategies” conducted by Kliueva and Tzagari in the year 2018. Data analysis was facilitated through Statistical Package for Social Sciences (SPSS) software employing frequency counts, percentage, weighted mean, standard deviation and Pearson r. Findings revealed that well-being and emotionality has the strongest relationships to the Emotional Literacy Strategies as they have the most number of significant correlations among all other aspects of Emotional Intelligence. On the other hand, sociability does not show any relationship with the strategy of supporting emotional growth, hence it is a factor that weakens the relationship between Emotional Intelligence and Emotional Literacy Strategies. It is then recommended for educators to improve their methods of interacting and communicating with students as it shows that the aspect of sociability has a weak relationship with the strategies of emotional literacy. Future studies should also be conducted to further validate the influence of teacher’s emotional intelligence to the emotional literacy strategies they are using inside their classrooms.

Keywords: Emotional Intelligence, Emotional Literacy, Strategies

INTRODUCTION

Emotions, being the affective facet of the human consciousness, play a vital role in establishing an adaptive behavior for the development of a self-directed individual. It is also labeled as a series of human behaviors that delivers a wealth of collective

information through the society. Though essential as it may seem, emotions can be chaotic and dangerous to illogical thought when one fails to control the discharge of these sensitive reactions, a reason for the manifestation of a frail emotional intelligence.

The cluster of competencies that captures a broad collection of individual skills which targets to progress one's levels of emotional understanding is referred to as the emotional intelligence (Park, 2010) that consists the potential for emotional fluency that as according to Gupta (2014), "Emotions are an intrinsic part of our biological makeup, and every morning they march into the office with us and influence our behavior."

Scuderi (2018) in the article titled What Is Emotional Intelligence and Why It Is Important, defined emotional intelligence, also known as emotional quotient (EQ), as an individual's level of ability to recognize and harness emotions to motivate oneself in order to demonstrate proper actions, and commit and work toward the accomplishment of his objectives for the reason that when one is able to properly manage its emotions, one is better able to communicate his feelings thus reflecting a well-handled negotiation between people.

Dodging a low emotional intelligence is essential, therefore practicing the four second-order factors: well-being, self-control, emotionality and sociability that comprise the dimensional domain of emotional intelligence are needed to be extremely developed all at the same time not only as these are interconnected to each other but because these factors determine the emotional literacy state of an individual.

Correspondingly, one's emotional intelligence is daily manifested in the areas of the community. For instance in a classroom, the attempt to stabilize the emotional intelligence among teachers during class discussions is a tough circumstance that gets even more difficult as they associate with different kinds of people having distinct personalities and emotions, that is why in order to efficiently manage their emotions, they needed to adapt various emotional literacy strategies to be able to effectively communicate and direct the students' emotions and behavior.

Steiner (2017) coined the term emotional intelligence in 1997 as the basis for perceiving and communicating emotions. It is a core skill of emotional intelligence that consists of a group of skills and strategies that an individual acquires over time to become emotionally fluent such as having self-awareness and self-discipline (i.e. the ability to quiet down feelings of anger and pessimisms). Having compassion to the feelings of other people while at the same time knowing how to express one's own emotions effectively are also signs of an emotionally literate individual. These abilities helps one in developing good communication skills and in enhancing one's relationship with other people (Douglas Silas Solicitors, nd).

In schools, being emotionally literate means being able to handle difficult emotional situations and in order to achieve a total literacy, various strategies are needed to be practiced including the establishment of a learning environment while ensuring a positive learning atmosphere for the learners.

Respectively, on the perspective of the learners, effective classroom management involves clear communication of behavioral potentials (Davis, 2009) that is why establishing relationship, responding to disruptive behavior, developing cooperative learning environment and supporting emotional growth are essential strategies to be trained.

As attention to the role of emotions in education, it is essential to examine how the teachers of Jones Rural School promote Emotional Literacy among students in order to create a conducive learning environment.

This study aims to explore and identify the relationship of emotional intelligence to the emotional literacy strategies of teachers of Jones Rural School. As there were variations of responses among the respondents, the gathered data were systematically examined by the researchers for the further assessment on the focus of the study.

Conceptual Framework

The following established frameworks can help to further explain the emotional intelligence of teachers and the teaching strategies they used in the classroom to develop students' emotional literacy.

Emotional intelligence encompasses of five basic components known as emotional self-awareness, self-recognition, handling relationships with others, motivating others and managing emotions (Goleman, 1995 as cited by Asrar-ul-Haq, Anwar & Hassan, 2018). In current research framework, 4 trait of Emotional intelligence have been taken into considerations in order to investigate their relationship with the teachers' teaching strategies they used in the classroom to develop students' emotional literacy.

According to Qualter, Gardner, Pope, Hutchison and Whiteley (2012), emotional usefulness plays a vital role in improving the abilities of emotional self-management among individuals with respect to their academic responsibilities. Moreover, Barsad (2000) stresses that, when positive emotions are developed in the employees in a group, it increases their cooperation with each other and lessens the conflicts which in turn improves the efficiency and performance of the group members.

In the study of Salami (2010), it was discovered that the academic achievement and performance of the students can be improved through self-efficacy, emotional intelligence and psychological well-being.

Mayer et al. (2000) claims that emotions play a vital role in influencing the mental operations of the individuals along with reasoning and motivation. It is crucial to study the emotions of teachers as well as their management of emotions which has found to affect their thinking, categorization as well as problem solving. There are many dimensions that are related to the teacher's

performance in the class which have traces of emotional intelligence components such as class room management, teaching methods and styles, individual differences and problem solving, use of motivational tools and direct teaching methods.

According to Evertson and Weinstein (2006), classroom management can be described as actions of the teachers which aim at the development of environment which helps in improving the social emotional learning and academic learning of the students. In relation to the classroom management, Emmer and Stough (2001) are of the view that if teachers are able to manage their own emotions then they can not only organize and manage class room environment, but can also manage the behaviors of the students to increase the positive academic outcomes. Moreover, research findings of Sieberer-Nagler (2015) discloses that, the most essential concerns relating to the classroom management of teachers include maintaining discipline and handling the emotional and social problems of the students. Teaching styles are found to affect the academic performance of the students.

According to Sorin (2009) emotional education should begin in the early childhood years so as to be as effective as possible through partnership approach. The approaches to emotion education include verbal approaches, such as acknowledgement, empathy, questioning and discussion; proactive approaches such as modeling and taking action; and using arts to explore feelings and emotion expression. She explores the importance of emotional literacy as the definition of literacy gradually expanded encompassing children who were having trouble regulating their negative feelings and are prone to anger, frustration etc.

Research by Raver (2002) has suggested that young children who are more emotionally well-adjusted have a greater chance of school success, regardless of their cognitive ability or family background.

Based on the premise that children's emotional education occurs through observing how others deal with emotions and stress and how they themselves respond to these emotions (Claxton, 2005), the promotion of EL in the classroom is most dependent upon teachers. The latter serve as classroom leaders who can bring about change in students' learning through effectively accommodating students' emotions. In other words, when teachers understand and regulate emotions, they "provide students with positive role models and the resources needed to thrive. (Brackett et al., 2009). Such teachers are more likely to help students develop EL.

Those teachers who fail to maintain discipline in class by managing their behavior cannot perform well in their initial phase of their career, which necessitates a high emotional intelligence (Ingersoll and Smith, 2003).

With the aforementioned concept on teachers' emotional intelligence and emotional literacy, the researcher believed it is essential to study these concepts to the faculty members of Jones Rural School, Jones, Isabela for it will give feedback on their emotional practices.

The main objective of the study is to find out if there is a significant relationship between teachers' level of emotional intelligence to their level of emotional literacy strategies. Hence, the independent variable comprises the teachers' profile as to age,

sex, years of teaching, average age of students and average number of students in class while the dependent variable consists of level of emotional intelligence and level of emotional literacy.

INDEPENDENT VARIABLE

DEPENDENT VARIABLES

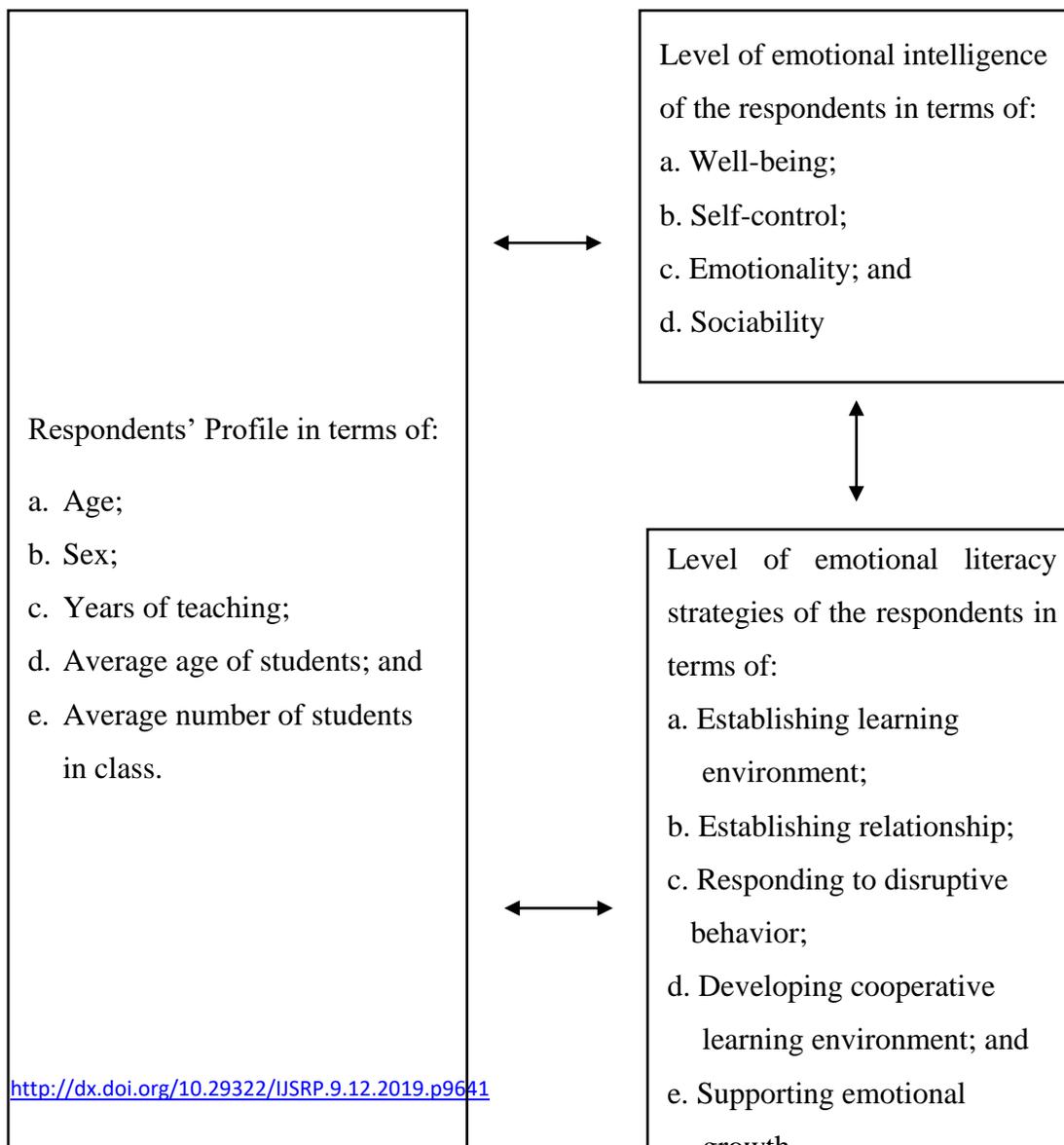


Figure 1. The Conceptual Paradigm of the Study

METHODOLOGY

Research Design

The researcher utilized the descriptive correlation method of research. Descriptive research was used to obtain information concerning the current status of the phenomena with respect to variables or conditions in a situation (Nyambongi. 2013).

The descriptive design was used to determine the respondents' level of emotional intelligence and level of emotional literacy strategies, while correlational was used to determine the relationship of the respondents' level of emotional intelligence and level of emotional literacy strategies when grouped according to their profile.

Locale of the Study

This study was conducted at Jones Rural School - Main, Jones, Isabela. The Jones Rural School (JRS) is located at the heart of the Municipality of Jones in the province of Isabela. Its vision to be a proud producer of globally competitive professionals in various areas has pushed the school to soar greater heights. This granted JRS to offer the Senior High School with Academic and Technology-Vocational-Livelihood (TVL) tracks.

Research Respondents

The respondents of the study were the 66 faculty members of Jones Rural School - Main, Jones, Isabela who are currently teaching during the school year 2018-2019. With a total population of 79, Slovin's formula was used to determine the ideal sample size for a population, at 95% confidence level and 5% margin of error.

Research Instrument

To attain the objectives of the study, a survey instruments were used to gather the information needed which were divided into three parts.

The first part of the questionnaire consisted of questions grouped around the socio – demographic profile of the respondents such as age, sex, years of teaching, average age of students and average number of students in class.

Second part and third part of the questionnaire were the emotional intelligence traits and the emotional literacy strategies used by the teachers.

The researcher patterned the questionnaire from the study “Emotional Literacy in EFL Classes: The Relationship between Teachers' Trait Emotional Intelligence Level and the Use of Emotional Literacy Strategies” conducted by Kliueva and Tsagari (2018).

The Level of Emotional Intelligence was presented in terms of well-being, self-control, emotionality and sociability. Responses were anchored through a 5-point likert scale with descriptive equivalents of 5 for Strongly Agree (SA), 4 for Agree (A), 3 for Moderately Agree (MA), 2 for Disagree (D) and 1 for Strongly Disagree (SD). The scores were converted to mean scores and given the corresponding values as follows:

Level of Emotional Intelligence Scale Weights, Ranges, and Descriptive Equivalent

Weights	Ranges	Descriptive Equivalent
5	4.50 – 5.00	Strongly Agree
4	3.50 – 4.49	Agree
3	2.50 – 3.49	Moderately Agree
2	1.50 – 2.49	Disagree
1	1.00 – 1.49	Strongly Disagree

The Level of Emotional Literacy Strategies was presented in terms of establishing learning environment, establishing relationship, responding to disruptive behavior, developing cooperative learning environment and supporting emotional growth. Responses was secured by the 5-point likert scale as follows: 5 for Always (A), 4 for Often (O), 3 for Sometimes (S), 2 for Rarely and 1 for Never (N). The scores were converted to mean scores and given the corresponding values.

Level of Emotional Literacy Strategies Scale Weights, Ranges, and Descriptive Equivalent

Weights	Ranges	Descriptive Equivalent
5	4.50 – 5.00	Always
4	3.50 – 4.49	Often
3	2.50 – 3.49	Sometimes
2	1.50 – 2.49	Rarely
1	1.00 – 1.49	Never

Data Gathering Procedures

There were various steps followed in conducting the study. These procedures guide the researcher to achieve the objectives of the study.

The researcher asked permission to conduct the study by means of a formal letter addressed to the Principal of Jones Rural School – Main. After which, availability of the faculty members who took part in the study were determined. Some of the respondents were contacted through facebook messenger and provided a link for the questionnaire created using google docs. Some expressed interest in the study and completed the survey independently. For a comprehensive and valid result, the survey questionnaires were administered and retrieved by the researcher; personally explain the objectives of the study, instructions on each of the questionnaires were thoroughly explained assuring that the answers of the participants are truthful and are their own.

Data Analysis

To attain valid and reliable data analysis and interpretation of the data, the following were used:

The data obtained were organized, tabulated, and computer-processed using Statistical Package for Social Sciences (SPSS) software employing frequency counts and percentage to describe the demographic profile of the respondents.

Weighted mean and standard deviation were utilized to determine the level of emotional intelligence and level of emotional literacy strategies of the respondents.

Pearson r was used to examine the significant relationship between the respondents' level of emotional intelligence and emotional literacy strategies when they grouped according to their age, years of teaching, average age of students and average number of students in class. Likewise, Pearson r was utilized to examine the relationship between the level of emotional intelligence and emotional literacy strategies.

FINDINGS

Table 1. Frequency Distribution and Percentage of the Respondents' Profile

PROFILE	FREQUENCY	PERCENTAGE (100%)
Age		
19 - 30 (Early Adulthood)	36	54.5%
31 – 50 (Middle Adulthood)	26	39.4%
51 – Retirement (Late Adulthood)	4	6.1%
Sex		
Male	20	30.3%
Female	46	69.7%
Years of Teaching		
1-9 years	43	65.2%
10-18 years	16	24.2%
19-27 years	3	4.5%
28-36 years	2	3.0%
37 years and above	2	3.0%
Average Age of Students		
12-14 years old	31	47.0%
15-17 years old	30	45.5%
18 years old and above	5	7.6%
Average Number of Students in Class		
15-30 students	16	24.2%
31-46 students	33	50.0%
47 students and above	17	25.8%

When grouped according to age, table 1 shows that 54.5% belongs to the bracket 19-30 years old, 39.4% between 31-50 years old, and the remaining 6.1% were 51 years old to retirement age. Evidently, most of the respondents were under the category of early adulthood, with a frequency count of 36 while that in the middle adulthood has a frequency count of 26 and under late adulthood it has a frequency count of 4.

As to sex, 30.3% or 20 respondents were male and female respondents comprised of 69.7% or 46. A higher percentage of female compared to male indicates that there are larger numbers of women nowadays who pursued teaching profession as stated by Philstar Global (2007) that men teachers are still outnumbered by women and only one in four teachers is male. Female teacher has a “natural mothering” characteristics in the classroom. It is natural for women to protect the child, considering their needs and demands, and contributes to their well-being.

Moreover, respondents’ years of teaching showed 65.2% of the respondents were in the teaching profession between 1-9 years while 24.2% of the respondents were teaching between 10-18 years, 4.5% between 19-27 years and 2% of the respondents were already teaching between 28-36 years and 37 years and above.

On the other hand, in terms of the average age of students handled by the respondents, 47.0% or 31 belong to the bracket 12-14 years old, 45.5% or 30 for the 15-17 years old, and 7.6% or 5 for 18 years old and above.

Lastly, average number of students in class shows that 24.2% or 16 of the respondents were teaching 15-30 students while 50.0% or 33 of the respondents were teaching between 30-46 students, and 25.8% or 17 of the respondents have an average of students ranging from 47 above.

Table 2. Computed Mean and Standard Deviation on the Level of Emotional Intelligence of the Respondents

Emotional Intelligence	Mean	Std. Deviation	Descriptive Equivalent
<i>Well-being</i>			
1. I generally find life enjoyable	4.38	0.855	A
2. I feel that I have a number of good qualities	4.24	0.703	A
3. I have a bright perspective on most things	3.17	1.410	MA
4. I am pleased with my life	4.09	0.890	A
5. I believed I am full of personal strengths	4.15	0.749	A
6. I generally believe that things will work out just fine in my life	4.17	0.597	A
Average Weighted Mean	4.03		A
<i>Self-Control</i>			
1. I usually find it easy to regulate my emotions	2.91	1.160	MA
2. I tend not to change my mind frequently	3.03	0.944	MA
3. I am able to deal with stress	3.88	0.920	A
4. I am usually able to find ways to control my emotions when I want to	4.03	0.632	A
5. I don't tend to get involved in things I later wish I could get out of	2.85	0.932	MA

6. Others admire me for being relaxed	3.52	0.965	A
Average Weighted Mean	3.37		MA
<i>Emotionality</i>			
1. Expressing my emotions with words is not a problem for me	3.83	0.938	A
2. I do find it easy to see things from other person's point of view	3.33	0.934	MA
3. I can able to figure out what emotion I am feeling	3.20	1.070	MA
4. Those close to often appreciate that I treat them right	3.94	1.108	A
5. I often find it easy to show my affection to those close to me,	3.74	0.933	A
6. I am normally able to "get into someone's shoes" and experience their emotions	3.89	0.914	A
7. I often pause and think about my feelings	3.91	0.717	A
8. I find it easy to bond well even with those close to me	3.64	1.132	A
Average Weighted Mean	3.69		A
<i>Sociability</i>			
1. I can deal effectively with people	4.02	0.832	A
2. I don't find it difficult to stand up for my rights	3.47	1.056	MA
3. I am usually able to influence the way other people feel	3.59	0.581	A
4. I would describe myself as a good negotiator	2.27	0.795	D
5. If I know I am right, don't tend to "back down"	3.17	0.954	MA
6. I seem to have power over other people's feelings	2.92	0.917	MA
Average Weighted Mean	3.24		MA
Grand Mean	3.58		A

Table 2 focuses on the teachers' emotional intelligence and its relationship in terms of various aspects, generating a grand mean of 3.58 with a general descriptive equivalent of A that tallies to Agree. The relationship of the teachers' emotional intelligence on well-being and emotionality indicates an average descriptive equivalent of A (Agree) as it has an average weighted mean of 4.03 for well-being and 3.69 for emotionality.

On the other hand, the relationship of the teachers' emotional intelligence on the aspects of self-control and sociability shows an average descriptive equivalent of MA (Moderately agree) with an average weighted mean of 3.37 for self-control and 3.24 for sociability.

Based from the responses in terms of Well-being, the following statements have a descriptive equivalent of A (Agree): Ranked first is the statement "I generally find life enjoyable," with a mean of 4.38, seconded by the statement "I feel that I have a number of good qualities," with a mean of 4.24, third is the statement "I generally believe that things will work out just fine in my life," with a mean of 4.17, fourth is the statement "I believed I am full of personal strengths," with a mean of 4.15 while the statement "I am pleased with my life," ranked fifth with a mean of 4.09. Lastly, the statement "I have a bright perspective on most things," ranked sixth with a mean of 3.17. Since the mean is distant from the average weighted mean, its descriptive equivalent is MA (Moderately Agree).

Furthermore, 50% of the statements under the aspect of Self-Control shows a descriptive equivalent of A (Agree) including the following statements that are arranged by decreasing mean value: "I am usually able to find ways to control my emotions when I want to," with a mean of 4.03, "I am able to deal with stress," with a mean of 3.88 and "Others admire me for being relaxed," with a mean of 3.52. On the other hand, the remaining half of the statements showed a descriptive equivalent of MA (Moderately Agree) including the statements "I tend not to change my mind frequently," with a mean of 3.03, "I usually find it easy to regulate my emotions," with a mean of 2.91 and "I don't tend to get involved in things I later wish I could get out of," with a mean of 2.85.

On the aspect of emotionality, 75% of the responses shows a descriptive equivalent of A (Agree) encompassing the following statements that are arranged in decreasing values of mean: "Those close to often appreciate that I treat them right," with a mean of 3.94, "I often pause and think about my feelings," with a mean of 3.91, "I am normally able to "get into someone's shoes" and experience their emotions," with a mean of 3.89, "Expressing my emotions with words is not a problem for me," with a mean of 3.83, "I often find it easy to show my affection to those close to me," with a mean of 3.74, "I find it easy to bond well even with those close to me," with a mean of 3.64. Meanwhile 25% indicates a descriptive equivalent of MA (Moderately Agree) including the statements "I don't find it difficult to see things from other person's point of view," with a mean of 3.33 and "I can able to figure out what emotion I am feeling," with a mean of 3.20.

Lastly, the aspect of Sociability shows that 33.33% of the responses have a descriptive equivalent of A (Agree) including the statements "I can deal effectively with people," with a mean of 4.02 and the statement "I am usually able to influence the way other people feel," with a mean of 3.59. On the other hand, 50% of the responses have a descriptive equivalent of MA (moderately agree), including the statements "I don't find it difficult to stand up for my rights," with a mean of 3.47, "If I know I am right, don't tend to "back down"," with a mean of 3.17 and "I seem to have power over other people's feelings," with a mean of 2.92; and lastly, 16.67% has a descriptive equivalent of D (Disagree) with the statement "I would describe myself as a good negotiator," with a mean of 2.27.

The results indicate that well-being and emotionality possess a huge impact on the emotional intelligence of the teachers, therefore the respondents of the study have a high level emotional intelligence. According to a website titled 'Exploring Your Mind' (2019) which primarily discusses on human psychology and philosophy, "Teachers who reprimand their students, who lack empathy, who punish them instead of saying "I'm here if you need help", and who even aggressively confront their students lack emotional intelligence."

Furthermore, Babu & Devi (2015) in their study titled 'A study on emotional intelligence among faculty members of selected engineering colleges in Kadapa region,' mentioned about self-esteem and optimism when it comes to the well-being of a person. This

indicates that when people have fine well-being, they tend to have more confidence that pushes them to strive in reaching the goals while being enthusiastic on things.

However the results also illuminates that educators hardly control their emotions in effectively dealing with the students and in being socially confident. Teachers who are weak in these aspects tend to struggle in interacting with the members of the society and in being assertive since they can barely motivate themselves on the attainment of the goal. (Babu & Davi, 2015). Teachers who are weak in these aspects also tend to faultily regulate stress.

Table 3. Computed Mean and Standard Deviation on the Level of Emotional Literacy Strategies of the Respondents

Emotional Literacy Strategies	Mean	Std. Deviation	Descriptive Equivalent
<i>Establishing Learning Environment</i>			
1. I specify the rules for acceptable behavior at the beginning of the course	4.39	0.721	O
2. I emotionally engage students to facilitate their thinking and behavior	4.35	0.644	O
3. I use humor to reduce tension and relieve boredom in the classroom	4.09	0.779	O
4. I use positive language to engage and challenge students, e.g.: <i>'The last lesson was fantastic and I don't expect anything less...</i>	4.14	0.699	O
Average Weighted Mean	4.24		O
<i>Establishing Relationships</i>			
1. I demonstrate personal interest in students	4.23	0.780	O
2. I display empathy towards the students	4.39	0.762	O
3. I talk to students about how the lesson is going	4.27	0.596	O
4. My responses to students' incorrect answers can make them feel comfortable	3.53	0.980	O
Average Weighted Mean	4.11		O
<i>Responding to Disruptive Behavior</i>			
1. I tend to take students' misbehavior personally	3.39	1.188	S
2. I try to find reasons behind students' misbehavior	4.20	0.728	O
3. I offer an opportunity for a private discussion after class if a student is disruptive	3.86	0.821	O
4. I provide an opportunity to the students to move beyond the incident and reestablish positive relationship	4.33	0.616	O
Average Weighted Mean	3.95		O
<i>Developing Cooperative Environment</i>			
1. I encourage communication among students through pair and group work	4.58	0.681	A
2. I teach students how to negotiate, ask their classmates to contribute and recognize their contribution	4.35	0.712	O
3. I monitor students' behavior towards each other and their contribution to the group work	4.39	0.579	O
4. I encourage students to give positive feedback to their classmates.	4.29	0.696	O
Average Weighted Mean	4.40		O
<i>Supporting Emotional Growth</i>			
1. I help students to develop personal responsibility for their own learning	4.45	0.587	O
2. I form positive thinking in students, e.g.: "I can do it," "Relax, breathe, I'm in control."	4.33	0.687	O
3. I believe it's necessary to help students identify and express their emotions	3.77	1.367	O
4. I explain to the students how to use a negative experience to motivate themselves	4.21	0.775	O
Average Weighted Mean	4.19		O
Grand Mean	4.18		O

Table 3 shows the relationship of the emotional literacy strategies of teachers in terms of various aspects with a grand mean of 4.18. The relationship of the emotional literacy strategies of teachers in terms of Developing Cooperative Environment shows an

average Correlation is significant at the 0.05 level (2-tailed) weighted mean of 4.40, followed by Establishing Learning Environment shows an average weighted mean of 4.24, then by Supporting Emotional Growth with an average weighted mean of 4.19, Establishing Relationships with an average weighted mean of 4.11 and lastly, Responding to Disruptive Behavior which shows an average weighted mean of 3.95. In general, the data all corresponds to a descriptive equivalent of O (Often).

Coupled with the data presented on the table above, the aspects on Establishing Learning Environment, Establishing Relationships and Supporting Emotional Growth show that 100% of the responses indicates a descriptive equivalent of O (Often). For the aspect of Establishing Learning Environment, the statement "I specify the rules for acceptable behavior at the beginning of the course," ranks first with a mean of 4.39. Second is the statement "I emotionally engage students to facilitate their thinking and behavior," with a mean of 4.35, followed by the statement "I use positive language to engage and challenge students e.g.: 'The last lesson was fantastic and I don't expect anything less today.'" with a mean of 4.14 and last is the statement "I use humor to reduce tension and relieve boredom in the classroom," with a mean of 4.09.

Meanwhile, the following are statements under the aspect of Establishing Relationships arranged with a decreasing mean value: "I display empathy towards the students," with a mean of 4.39, followed by "I talk to students about how lesson is going," with a mean of 4.27, then by "I demonstrate personal interest in students," with a mean of 4.23 and last is the statement "My responses to students' incorrect answers can make them feel comfortable," having a mean of 3.53.

On the aspect of Supporting Emotional Growth, the statement "I help students to develop personal responsibility for their own learning," with a mean of 4.45 ranks first, "I form positive thinking in students, e.g.: "I can do it," "Relax, breathe, I'm in control."" with a mean of 4.33 ranks second, "I explain to the students how to use a negative experience to motivate themselves," with a mean of 4.21 ranks third while the statement "I believe it's necessary to help the students identify and express their emotions," with a mean of 3.77 ranks fourth.

On the aspect of Responding to Disruptive Behavior, the findings show that 75% among the responses has a descriptive equivalent of S (Sometimes) including the following statements arranged in decreasing mean value: "I provide an opportunity to the students to move beyond the incident and reestablish positive relationship," with a mean of 4.33, followed by the statement "I try to find reasons behind students' misbehavior," with a mean of 4.20, then by the statement "I offer an opportunity to the students to move beyond the incident and reestablish positive relationship," with a mean of 3.88; while 25% among the responses show a descriptive equivalent of S (Sometimes) that comprises the statement "I tend to take students' misbehavior personally," with a mean of 3.29.

Based from the evaluated responses on the aspect of Developing Cooperative Environment, 75% shows a descriptive equivalent of O (Often) while 25% shows a descriptive equivalent of A (Always). The following statements under this aspect are arranged based from a decreasing mean value: “I encourage communication among students through pair and group work,” with a mean of 4.58, followed by the statement “I monitor students’ behavior towards each other and their contribution to the group work,” with a mean of 4.39, then the statement “I teach students how to negotiate, ask their classmates to contribute and recognize their contribution,” with a mean of 4.35 and lastly, the statement “I encourage students to give feedback to their classmates,” with a mean of 4.29.

This indicates that the five different strategies of emotional literacy are habitually utilized in school. Elias (2017) in his article titled Helping Children Develop Emotional Literacy, emphasized that, “emotional literacy is a key aspect of emotional intelligence,” therefore being able to apply these strategies will help the teachers to learn and understand more about the emotions of their students. In this sense, they will be guided on how to properly respond to varied emotions from different kinds of people.

Since two of the strategies of promoting emotional literacy is to establish and develop a cooperative learning environment, Adeniyi & Anuodo (2018) stated that developing a positive affection towards the teachers’ professional duties should be taken into consideration along with applying the mentioned strategies as this will help in the progress of the students’ learning.

Table 4. Relationship between the Emotional Intelligence of the Respondents when they are Grouped according to the Demographic Profile such as Age, Sex, Years of Teaching, Average No. of Students, and Average Age of Students

Emotional Intelligence	Age	Sex	Years of Teaching	Average No. of Students	Average Age of Students
<i>Well-being</i>					
1. I generally find life enjoyable	0.016	0.266	0.508	0.793	0.196
2. I feel that I have a number of good	0.025	0.417	0.431	0.718	0.953
3. I have a bright perspective on most things	0.055	0.616	0.015	0.518	0.227
4. I am pleased with my life	0.003	0.725	0.005	0.160	0.860
5. I believed I am full of personal strengths	0.003	0.472	0.096	0.444	0.468
6. I generally believe that things will work out just fine in my life	0.217	0.767	0.191	0.014	0.532
<i>Self-Control</i>					
1. I usually find it easy to regulate my emotions	0.170	0.269	0.598	0.819	0.449
2. I tend not to change my mind frequently	0.005	0.464	0.342	0.648	0.462
3. I am able to deal with stress	0.661	0.169	0.160	0.651	0.706
4. I am usually able to find ways to control my emotions when I want to	0.142	0.149	0.075	0.615	0.507
5. I don’t tend to get involved in things I later wish I could get out of	0.014	0.257	0.029	0.844	0.733
6. Others admire me for being relaxed	0.008	0.458	0.011	0.937	0.422
<i>Emotionality</i>					
1. Expressing my emotions with words is not a problem for me	0.061	0.070	0.332	0.237	0.976
2. I do find it easy to see things from other person’s point of view	0.003	0.725	0.005	0.160	0.860
3. I can able to figure out what emotion I am feeling	0.003	0.472	0.096	0.444	0.468

4.	Those close to often appreciate that I treat them right	0.217	0.767	0.191	0.014	0.532
5.	I often find it easy to show my affection to those close to me,	0.170	0.269	0.598	0.819	0.449
6.	I am normally able to “get into someone’s shoes” and experience their emotions	0.429	0.403	0.494	0.422	0.558
7.	I often pause and think about my feelings	0.153	0.119	0.555	0.863	0.616
8.	I find it easy to bond well even with those close to me	0.552	0.686	0.992	0.552	0.688

Sociability

1.	I can deal effectively with people	0.001	0.389	0.049	0.186	0.997
2.	I don’t find it difficult to stand up for my rights	0.180	0.246	0.320	0.741	0.811
3.	I am usually able to influence the way other people feel	0.039	0.016	0.003	0.427	0.106
4.	I would describe myself as a good negotiator	0.003	0.880	0.005	0.337	0.622
5.	If I know I am right, don’t tend to “back down”	0.047	0.458	0.341	0.586	0.567
6.	I seem to have power over other people’s feelings	0.235	0.189	0.857	0.289	0.718

**Boldface. Correlation is significant at the 0.05 level (2-tailed).*

Table 4 shows the relationship of the teachers’ emotional intelligence to the socio-demographic information of the respondents.

The table indicates that Age has the strongest relationship to the aspect of Sociability as it has 0.001 significance level to the statement “I can deal effectively with people,” 0.003 significance level to the statement “I am usually able to influence the way other people feel,” 0.039 significance level to the statement “I would describe myself as a good negotiator,” and a 0.047 significance level to the statement “If I know I am right, don’t tend to “back down.”

Correspondingly, the table shows that Age has only strong relationship to Well-being and Self-Control and has a weak relationship to Emotionality.

Furthermore, the table respectively shows that Sex only possesses a relationship with Sociability with a significance level of 0.016 at the statement “I am usually able to influence the way other people feel.” It does not have any relationship to the aspects of Well-being, Self-Control and Emotionality.

Table 4 similarly shows that Years of Teaching has the strongest relationship to Sociability as it shows a 0.003 significance level to the statement “I am usually able to influence the way other people feel,” 0.005 significance level to the statement “I would describe myself as a good negotiator,” and a 0.049 significance level to the statement “I can deal effectively with people.”

It also shows that Years of Teaching has a strong relationship to Well-being and Self-Control and has a weak relationship to Emotionality.

Equally important, the table shows that the Average Number of Students only holds a relationship with Well-being and

Emotionality while the Average Age of Students shows no relationship to any aspect at all.

Based on the findings presented on table 4, it shows that a teacher’s age, sex and his years of teaching have the greatest impact on the overall aspects of Emotional Intelligence specifically on sociability. It only indicates that these socio-demographic factors supports their abilities to proficiently communicate and interact with others (Babu & Davi, 2015).

However, among all the socio-demographic factors, age has the most impact on the aspects of Emotional Intelligence. This was further supported by the study of Stami, Ritin & Dominique (2018) titled Demographic predictors of emotional intelligence among radiation therapists which identified, “a positive correlation between emotional intelligence and age with older people reporting higher emotional intelligence.”

Table 5. Relationship between the Emotional Literacy Strategies of the Respondents when they are Grouped according to the Demographic Profile such as Age, Sex, Years of Teaching, Average No. of Students, and Average Age of Students

Emotional Literacy Strategies	Age	Sex	Years of Teaching	Average No. of Students	Average Age of Students
<i>Establishing Learning Environment</i>					
1. I specify the rules for acceptable behavior at the beginning of the course	0.015	0.680	0.049	0.544	0.925
2. I emotionally engage students to facilitate their thinking an behavior	0.024	0.690	0.054	0.748	0.211
3. I use humor to reduce tension an relieve boredom in the classroom	0.591	0.457	0.964	0.682	0.258
4. I use positive language to engage and challenge students, e.g.: ‘The last lesson was fantastic and I don’t expect anything less today.’	0.032	0.300	0.344	0.334	0.307
<i>Establishing Relationships</i>					
1. I demonstrate personal interest in students	0.174	0.386	0.333	0.439	0.865
2. I display empathy towards the students	0.918	0.315	0.321	0.221	0.891
3. I talk to students about how the lesson is going	0.051	0.121	0.258	0.199	0.713
4. My responses to students’ incorrect answers can make them feel comfortable	0.834	0.126	0.021	0.248	0.934
<i>Responding to Disruptive Behavior</i>					
1. I tend to take students’ misbehavior personally	0.661	0.169	0.160	0.651	0.706
2. I try to find reasons behind students’ misbehavior	0.142	0.149	0.075	0.615	0.507
3. I offer an opportunity for a private discussion after class if a student is disruptive	0.257	0.930	0.157	0.185	0.812
4. I provide an opportunity to the students to move beyond the incident and reestablish positive relationship	0.588	0.249	0.400	0.833	0.852
<i>Developing Cooperative Environment</i>					
1. I encourage communication among students through pair and group work	0.313	0.075	0.809	0.561	0.155
2. I teach students how to negotiate, ask their classmates to contribute and recognize their contribution	0.375	0.718	0.655	0.772	0.169
3. I monitor students’ behavior towards each other	0.367	0.185	0.855	0.203	0.476

	and their contribution to the group work					
4.	I encourage students to give positive feedback to their classmates.	0.821	0.292	0.416	0.481	0.860
<hr/>						
<i>Supporting Emotional Growth</i>						
1.	I help students to develop personal responsibility for their own learning	0.877	0.344	0.763	0.952	0.454
2.	I form positive thinking in students, e.g.: “I can do it,” “Relax, breathe, I’m in control.”	0.284	0.154	0.450	0.343	0.867
3.	I believe it’s unnecessary to help students identify and express their emotions	0.690	0.387	0.438	0.193	0.172
4.	I explain to the students how to use a negative experience to motivate themselves	0.839	0.070	0.693	0.165	0.475

Table 5 shows the relationship of the teachers’ emotional literacy strategies to the socio-demographic information of the respondents.

The table indicates that Age only possesses a relationship to the aspect of Establishing Learning Environment as the table presents that it has a 0.015 significance level at the statement “I specify the rules for acceptable behavior at the beginning of the course,” a 0.024 significance level at the statement “I emotionally engage students to facilitate their thinking and behavior,” and a 0.032 significance level to the statement “I use positive language to engage and challenge students e.g.: ‘The last lesson was fantastic and I don’t expect anything less today.’”

Similarly, the table shows that the Years of Teaching holds a relationship with the aspects of Emotional Learning Environment as it has a significance level of 0.049 to the statement “I specify the rules for acceptable behavior at the beginning of the course,” and to the aspect of Establishing Relationships for having a significance level of 0.021 to the statement “My responses to students’ incorrect answers can make them feel comfortable.”

Meanwhile, the Sex, Average Number of Students and the Average Age of the Students shows no significance to any of the aspects of Emotional Literacy Strategies.

Although the table shows that age and the teachers’ years of teaching have impacts on the strategies of emotional literacy, this indicates that the socio-demographic factors barely affects or impacts the strategies of emotional literacy.

Table 6. Correlations between Emotional Intelligence and Emotional Literacy Strategies of the Respondents

EMOTIONAL LITERACY STRATEGIES																					
Establishing Learning Environment					Establishing Relationships				Responding to Disruptive Behavior				Developing Cooperative Environment				Supporting Emotional Growth				
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Well-Being	1	0.024	0.101	0.676	0.008	0.002	0.053	0.012	0.005	0.342	0.682	0.551	0.275	0.001	0.507	0.040	0.433	0.255	0.161	0.419	0.493
	2	0.003	0.139	0.919	0.650	0.597	0.598	0.439	0.126	0.627	0.658	0.802	0.217	0.756	0.277	0.415	0.921	0.705	0.933	0.396	0.092
	3	0.353	0.770	0.054	0.418	0.867	0.704	0.076	0.432	0.315	0.348	0.559	0.925	0.831	0.555	0.157	0.003	0.099	0.218	0.012	0.940
	4	0.001	0.292	0.420	0.816	0.239	0.767	0.883	0.164	0.849	0.427	0.593	1.000	0.754	0.081	0.745	0.348	0.521	0.688	0.037	0.821
	5	0.000	0.001	0.849	0.276	0.001	0.190	0.144	0.102	0.776	0.363	0.139	0.129	0.000	0.728	0.001	0.792	0.333	0.109	0.452	0.691
	6	0.054	0.790	0.061	0.883	0.234	0.123	0.730	0.861	0.908	0.742	0.531	0.012	0.156	0.532	0.554	0.402	0.158	0.107	0.408	0.658
Self-Control	1	0.260	0.070	0.545	0.741	0.111	0.930	0.257	0.241	0.161	0.254	0.623	0.301	0.239	0.871	0.907	0.383	0.555	0.644	0.131	0.862
	2	0.562	0.283	0.485	0.285	0.034	0.413	0.232	0.421	0.043	0.642	0.840	0.574	0.586	0.899	0.860	0.392	0.275	0.487	0.883	0.923
	3	0.022	0.012	0.132	0.243	0.090	0.280	0.792	0.866	0.359	0.417	0.145	0.311	0.270	0.679	0.467	0.745	0.591	0.897	0.073	0.643
	4	0.744	0.927	0.482	0.940	0.892	0.841	0.423	0.046	0.106	0.239	0.438	0.461	0.164	0.239	0.279	0.691	0.088	0.218	0.228	0.518
	5	0.026	0.921	0.724	0.229	0.160	0.381	0.872	0.757	0.149	0.722	0.954	0.569	0.734	0.780	0.809	0.832	0.729	0.949	0.127	0.316
	6	0.005	0.155	0.422	0.427	0.128	0.441	0.148	0.894	0.254	0.451	0.047	0.166	0.651	0.978	0.215	0.002	0.001	0.215	0.833	0.717
Emotionality	1	0.057	0.436	0.400	0.108	0.933	0.647	0.379	0.911	0.139	0.697	0.577	0.887	0.949	0.976	0.880	0.138	0.023	0.160	0.811	0.536
	2	0.429	0.054	0.499	0.346	0.006	0.818	0.120	0.754	0.941	0.078	1.000	0.152	0.026	0.806	0.092	0.660	0.823	0.276	0.247	0.955
	3	0.155	0.419	0.979	0.536	0.373	0.778	0.780	0.004	0.240	0.806	0.113	0.419	0.203	0.227	0.862	0.074	0.709	0.824	0.021	0.530
	4	0.948	0.654	0.509	0.379	0.561	0.836	0.565	0.724	0.330	0.427	0.461	0.549	0.042	0.685	0.097	0.732	0.270	0.235	0.930	0.652
	5	0.157	0.224	0.267	0.166	0.245	0.324	0.089	0.013	0.715	0.182	0.913	0.061	0.006	0.843	0.025	0.721	0.541	0.038	0.691	0.785
	6	0.281	0.764	0.251	0.032	0.536	0.008	0.041	0.468	0.888	0.237	0.618	0.771	0.426	0.516	0.068	0.018	0.017	0.000	0.455	0.006
	7	0.023	0.103	0.576	0.236	0.037	0.450	0.181	0.579	0.814	0.781	0.009	0.265	0.031	0.827	0.011	0.015	0.000	0.011	0.585	0.779
	8	0.058	0.951	0.800	0.077	0.058	0.623	0.079	0.014	0.823	0.191	0.532	0.289	0.082	0.688	0.005	0.444	0.141	0.204	0.966	0.665
Social Skills	1	0.046	0.544	0.459	0.094	0.014	0.372	0.006	0.259	0.842	0.715	0.197	0.690	0.599	0.334	0.012	0.003	0.054	0.059	0.533	0.818
	2	0.111	0.972	0.786	0.227	0.460	0.270	0.384	0.761	0.013	0.269	0.695	0.660	0.478	0.647	0.335	0.094	0.225	0.111	0.441	0.109

... at the 0.05 level (2-tailed).

	3	0.049	0.429	0.348	0.315	0.971	0.465	0.562	0.034	0.315	0.436	0.029	0.493	0.652	0.189	0.387	0.815	0.237	1.000	0.742	0.729
	4	0.080	0.012	0.746	0.588	0.069	0.672	0.814	0.308	0.047	0.452	0.785	0.452	0.222	0.875	0.771	0.397	0.314	0.653	0.992	0.446
	5	0.002	0.665	0.066	0.407	0.364	0.283	0.666	0.497	0.943	0.301	0.307	0.945	0.377	0.976	0.135	0.128	0.076	0.662	0.278	0.164
	6	0.133	0.794	0.803	0.480	0.846	0.051	0.449	0.003	0.112	0.711	0.959	0.772	0.677	0.961	0.160	0.294	0.604	0.297	0.370	0.597

Results from Table 6 indicated the relationship between Well-being and the different strategies that comprises Emotional Literacy since this aspect exhibited a correlation among all the strategies. The Well-being of teachers had a strong influence on Establishing a Learning Environment specifically on specifying the rules for acceptable behavior at the beginning of course. It also showed that it has the same influence on the development of a cooperative environment specifically for encouraging communication among students through pair and group work and in monitoring their behavior towards each other and to the work.

As Table 6 illustrates, the aspect of Self-Control under Emotional Intelligence correspondingly established a relationship with all the strategies of Emotional Literacy as it discreetly influence the establishment of a learning environment mainly on specifying the rules for acceptable behavior at the beginning of course. While the aspect of emotionality similarly indicates a relationship with the strategies concerning the emotional literacy of teachers, it has a low influence on Establishing a Learning Environment for it only correlates to two statements. Emotionality had a high influence on the development of a cooperative environment since this strategy showed a correlation with nine statements regarding the aspect of emotionality.

In connection, Sociability was found to have weak relationship to the strategies of Emotional Literacy since it did not correlate to any statement on the strategy of Supporting Emotional Growth although it did had an influence on the strategies of establishing a learning environment, establishing relationships, responding to disruptive behavior and on developing a cooperative environment.

Referring to the data shown in table 6, this indicates that there is a need for educators to improve their methods of interacting and communicating with students as it shows that the aspect of sociability has a weak relationship with the strategies of emotional literacy. Serrat (2017) in his book titled Knowledge Solutions listed eight possible ways to strengthen one's sociability including wielding effective tactics for persuasion, negotiating and resolving disagreements and working with others toward shared goals. Having improved this aspect will definitely hone one's emotional intelligence for the reason that for a person to have an extremely high level of EQ, all the aspects that comprises it should be fine and well-developed.

CONCLUSIONS

1. The respondents possess a high level of emotional intelligence since they believed that they hold an effective well-being and emotionality.
2. Generally, the strategies of Emotional Literacy are often applied by the teachers of Jones Rural School.
3. The socio-demographic factors have significant impacts on the aspects of Emotional Intelligence.
4. There was no significant impact between the socio-demographic factors on the Emotional Literacy Strategies.
5. Well-being and Emotionality has the strongest relationships to the Emotional Literacy Strategies as they have the most number of significant correlations among all other aspects of Emotional Intelligence.
6. The aspect of sociability does not show any relationship with the strategy of supporting emotional growth, hence it is a factor that weakens the relationship between Emotional Intelligence and Emotional Literacy Strategies.

RECOMMENDATIONS

1. The lack of sociability could be one of the hindrances among teachers on understanding the emotions of their students as well as their fellow educators, thus the department should organize a workshop that aims to strengthen the social skills of each teacher.
2. One of the missions of the Department of Education is for the students to learn in a safe and motivating environment. In connection with the Emotional Literacy Strategies, the school – through the initiatives of department heads and teachers – should improve the learning environment of its students.
3. Handling a diverse behavior is one of the factors that obstructs the teachers' focus inside the classroom, therefore, having an orientation regarding proper behavior must be piloted for both teachers and students.
4. There is also a need to explore on effective ways on improving self-control which could include learning how to set one's priorities and asserting on which decisions to make.
5. Future studies should be conducted to further validate the influence of teacher's emotional intelligence to the emotional literacy strategies they are using inside their classrooms.

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BOX-PCR based genotyping of *Pseudomonas aeruginosa* isolates from burn wounds

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Abstract: BOX-PCR is a satisfactory apparatus for clinical *Pseudomonas aeruginosa* isolates from burn wounds. *Pseudomonas aeruginosa* is an infectious organism can be found in hospital atmosphere and home tanks such as, baths, dish cloths, sinks, and floors as well. *Pseudomonas aeruginosa* is a typical Gram-negative, pole molded bacterium that can cause ailment in plants and creatures, including people. It is also important nosocomial pathogen of humans, primarily infecting immune compromised patients such as severely burned patients, patients with cystic fibrosis, and cancer patients undergoing chemotherapy. BOX-PCR finger printing method was assessed for refinement of quantifiable *Pseudomonas aeruginosa* sequesters. Altogether quarantines were type-able in addition partial shows banding arrays. BOX-PCR finger printing was associated for typing of *Pseudomonas aeruginosa* isolates from burn wounds. Identification of isolates from burn wounds was performed by biochemical assessments and confirmed by the BOX-PCR. Present-day training intended to molecular characterize sequesters that was attained from diverse treatment center of Faisalabad by using DNA fingerprinting techniques in which repeat sequence was used for Box PCR. Hence forward, this technique may well be of cherished use in scheming sources of transmission and principally stopping the hospital related infections that cause by the straining. The antibiotyping and genotyping of *P. aeruginosa* isolated from burn patients was checked. On the base of strain differentiation criteria for PFGE of *P. aeruginosa* by analysis was done. Molecular epidemiology of Carba-penem Resilient *Pseudomonas aeruginosa* sequesters in non-burn and burn patients by BOX-PCR method and detected by metallo- β -lactamases (MBLs). The main objective is to identify the genetic variation among Human *Pseudomonas aeruginosa* strains isolated from different hospitals by using BOX primer.

Index Terms- *Pseudomonas aeruginosa*, Gram-negative, nosocomial, transmission, Pulsed-Field Gel Electrophoresis (PFGE), metallo- β -lactamases (MBLs)

INTRODUCTION

P. aeruginosa is a characteristic Gram-ve, pole shaped microbial which can be able to cause infirmity in plant and animal life, including human beings. It has the capability to transform into opportunistic pathogen when there is a fissure of host soft tissue barriers or repressed immune structure. It is also important nosocomial pathogen of humans, primarily infecting immune compromised patients such as severely burned patients, patients with cystic fibrosis, and cancer patients undergoing chemotherapy (Wagner *et al.*, 2008). It is responsible for about 10-20% of nosocomial infections which are seen as septicemia in intensive care units, cystic fibrosis, burns and wound infections (Carmeli *et al.*, 1999). Varieties of important medicinal significance *Pseudomonas aeruginosa* is multidrug harmless disease causing agent observed for its omnipresence. It's naturally propelled anti-toxin protection systems, and its association with genuine diseases – healing facility acquired contaminations, e.g. ventilator related pneumonia and diverse sepsis conditions. Living being is observed as innovative sighted

that unaffected contamination repeatedly occurs within prevailing infections and disorders most obviously cystic fibrosis and unbearable consumes. It's therefore discovered for some part in immune compromised patients up till now can taint immunocompetent as in hot tub. *Pseudomonas aeruginosa* is resourceful human infection causing agent and it cause infections in hospital related surroundings. It can cause very badly nosocomial contaminations especially in immuno-compromised patients. People with wound infections as well as burn victims and patients that are hospitalized in intensive care units are infected by *Pseudomonas aeruginosa* that is spread across nosocomial infections (Hauser.A.R.*et al.*, 2012).

The greater occurrence of *P. aeruginosa* is owing to its capability of generating lipase, collagenase, protease and elastase that assist it to assault the core of cells. *P. aeruginosa* is versatile organism and has the ability to form the bio-films on the surfaces of catheters. *P. aeruginosa* has the resistance against many antibiotics and also some of disinfectants. (Stover *et al.*, 2000) *Pseudomonas aeruginosa* accounts for 10% of all environment

of hospital acquired infections. Some sources of *Pseudomonas aeruginosa* are sinks, tap waters also found in disinfectants and mops etc. (Deplano A. *et al.*, 2005). Carbapenems are significant drugs used for *Pseudomonas aeruginosa* contaminations. Metallo- β -lactamases are efficiently able to hydrolyze classes of drugs. Instant detection of MBL- producing *Pseudomonas aeruginosa* is required to treat this kind of organism. (Ahmad farajzadeh Sheikh *et al.*, 2014).

Injury infection, and burn wounds are main cause of decease in previous few years. It is hard to give treatment due to its harshness and complexity. It is stated that 2.6 billion individuals in United Kingdom have burn contamination to each year and have need of intensive medicinal caution. Out of these one lac people are admitted to hospitals and more than 15 thousand are pass away owing to inappropriate precaution of burn wounds injury. In line for thermal wound contamination epidermis skin is nowhere to be found that may allow most of the contagious settlement. (Mayhall, 2003).

Nomenclature The term *Pseudomonas* signifies "incorrect unit" and aeruginosa signifies a "solitary unit" The Mon schedule in historical backdrop of microbiol. To allude microbes. *Aeruginosa* is Latin word significance "copper rust" alluding to bluish shade of species. This bluish color is mixture of 2 metabolite of *P. aeruginosa*, pyocyanin (blue), pyoverdine (green) which confer bluish green shade of microbial culture.

Genome

Aeruginosa is generally vast genome size (5.6– 6.8 Mb) and codes in vicinity of 5,600 and 7,000 undeveloped perusing outlines, contingent upon strain assessment of 398 genomes from various *aeruginosa* straining demonstrated only 18.5% is common.

Metabolic rate

P. aeruginosa is facultative anaerobe, as it multiply in states of fractional or aggregate oxygen exhaustion. This life form can accomplish anaerobic development with nitrate. Adaptation to miniaturized scale high-impact or anaerobic situations is fundamental for specific ways of life of *Pseudomonas* genus for instance, Lungs contamination in CS patients where dense layer of lung body fluid gathered encompassing mucoid microbial organisms restrict dispersion of oxygen. Biofilms can bring into being in lung of individual having CS in addition to essential ciliary dyskinesia and can demonstrate deadly.

Pathogenesis

A sharp, nosocomial disease causing agent of immune compromised people *Pseudomonas aeruginosa* ordinarily defects urinary path and wounds and also causes blood contaminations. It is reason for diseases of consuming wounds of external ear and is more continuous colonist of medicinal gadgets e.g., catheter.

P. aeruginosa know how to spread that becomes damaged as well as not legitimately scrubbed on figure of human services workers. *P. aeruginosa* is uncommon condition basis in group of

procured pneumonias and additionally ventilator-related pneumonias. Pyocyanin is destructiveness feature of microbes and can be cause in *C. elegans* by the means of oxidative pressure. In any case, salicylic acid can hinder pyocyanin production. One out of ten healing facility gained contaminations is from *P. aeruginosa*. Cystic patients can be additionally inclined to contamination of *pseudomonas* in lungs.

The genus *aeruginosa* may likewise be a typical reason for warm tub impulsive microorganisms like wet conditions, for example, warm tub and pool where they cause rash of skin. *P. aeruginosa* is additionally a reason for disease in spiral keratotomy surgical treatment patients. Individual is linked with injury of skin and asthma gangrenous. *P. aeruginosa* is as often as possible related with osteomyelitis including cut injuries of the foot because of direct vaccination with *P. aeruginosa* by means of bubbles cushioning found in sneakers, with diabetic patients in complex hazard.

Multi resistant *P. aeruginosa*

Multi resistant *P. aeruginosa* (MR-PA) is infectious disease causing agent which can reason of nosocomial contagions and outbursts in global world. Out of these some of the contagions are frequently related to greater death rates in addition to some of the patients with (HIV) and (AIDS). (PFGE) Pulse field gel electrophoresis is suggested method for decisive genotyping of nosocomial disease causing agent. It is an apparatus to regulate nosocomial contaminations. Multifaceted strategies by means of molecular epidemiology method for regulating MR-PA infectious outbursts in immunocompromised suffering persons, particularly with cancer and the patients that have been hospitalized to intensive care units (ICUs) can be assumed.

Phenazines

Phenazines are basically dynamic shades created by *Pseudomonas*. Some of the shades are associated with majority of detecting, destructiveness, and iron acquisition. *P. aeruginosa* produces a few colors delivered by biosynthesis passageway: pyocyanin one hydroxyl, phenazine-1-carboxamide, corrosive betaine. 2-operons are associated through the biosynthesis of phenazine: *phzA1b1c1d1e1f1g1* and *phzA2b2C2e2F2g2*. Operons change over a chiasmic destructive to phenazines.

Biofilms and treaty protection

Biofilms of *P. aeruginosa* effects unending shrewd diseases, which are major issue for immunocompromised patients. They regularly can't be allocated with viably anti-infection treatment. Biofilms appear to shield these microbes from unfavorable ecological elements. *Pseudomonas* genus cause contaminations and can be viewed as classical creature for investigation of anti-toxin safe microbes.

Numerous qualities influence biofilms arrangement in *P. aeruginosa*. One of principle quality operons in charge of start and keeping up biofilm is operon of PSL. 16-quality operon is in charge of cell to cell and surface of the cell required for cell

correspondence. This framework is made out of starches, amino acid as well as different particles. This lattice is fundamental protection components in biofilms of *P. aeruginosa*.

Cyclic-di GMP is noteworthy supporter of biofilms whenever biofilms are less supporter to handle. Polysaccharide blend locus and cyclic-GMP shape a progressive condemnation. PSL fortifies cyclic GMP creation, even though greater compact disc GMP turn the operon on and then expands action of the operon.

P. aeruginosa has three extracellular polysaccharides for example. PEL, PSL and alginate. It uses PEL and PSL polysaccharide to form biofilm in-vitro. Late examinations have demonstrated that scattered cells from this bacterium like *pseudomonas* biofilms bring down the cyclic GMP intensities and also the cells of biofilms.

Analysis of *Pseudomonas aeruginosa*

Contingent upon natural surroundings of disease a fitting example is gathered and directed to the microbiology research facility for ID. Similarly, some of the microbiological examples, Gram recolor is achieved, that can indicate Gram -ve poles and potentially white platelets. *Pseudomonas* produces settlements with "grape like" on microbiological medium. In amalgamated societies, this have been detached as unblemished on Mac Conkey agar which will test positive for oxidase. A TSI incline is frequently used to recognize non-aging *Aeruginosa* specie from intestinal pathogen especially in fecal examples.

Whenever *Pseudomonas* is detached from (plasma, jaw bone, profound accumulations) and can be assumed to be hazardous and requires treatment. However, *Pseudomonas aeruginosa* is often inaccessible basically from nonsterile locales (sputum, swabs and mouth) further down some of the conditions, it might speak to colonization not disease. Frequently no cure is required.

Treatment

Numerous *Pseudomonas* confines can be unaffected to considerable scope of anti-infection agents and can exhibit extra protection after ineffective cure. It ought to be conceivable to manage treatment as indicated by research center sensitivities, instead of picking an anti-microbial exactly.

As fluoroquinolone is one of anti-toxins that is generally successful against *P. aeruginosa*. Its utilization is limited to stay away from advancement of safe straining. In uncommon events where disease is low and constrained (e.g., earlobe contaminations and some other diseases), contemporary gentamicin might be utilized. Typically, sterile bandage soaked with acidic corrosive is put on injury after water system with ordinary salt-water. Bandages can be done on daily basis. *Aeruginosa* is generally killed in 95% of cases following 12 to 15 days of cure.

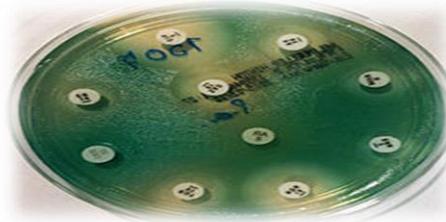


Figure no 1.1 Antibiogram of *P. aeruginosa* on Mueller Hinton agar

Treatment of *Pseudomonas aeruginosa* in humans

Pseudomonas aeruginosa could be a noteworthy reason for welfare connected contaminations Associate in nursing protection among ambit is an increasing load. The examination intention was to portray national protection rates for clinical *P. aeruginosa* metastasis and vascular system societies and also the commonness of multidrug-safe (MDR) *P. aeruginosa* within the Veterans Affairs (VA). MDR was characterized as non-powerlessness to no not up to one medication in no not up to three of the related five classifications: carbapenems, broadened vary cephalosporins, aminoglycosides, and piperacillin. We have a tendency to surveyed twenty-four, 562 *P. aeruginosa* metastasis and circulation system segregates crosswise over 126 VA offices between 2009 moreover, 2013. Most separates were gathered from patient settings (82%). Protection was most noteworthy in fluoroquinolone (33%) and surpassed two hundredth for all categories evaluated (carbapenems, broadened vary mefoxin, aminoglycosides, and piperacillin/tazobactam). Protection was higher in patient settings and in metastasis segregates. Predominance of MDR was two hundredth typically speaking (22% for patient disconnects, Martinmas patient, twenty first metastasis, terrorist organization circulatory system). Our discoveries area unit inevitable with past observation reports (Appaneal *et al.*, 2018)

Kynurenine forma midase (KynB) frames some portion of the kynurenine pathway that utilizes tryptophane to anthranilate. This substance will be utilized for downstream creation of 2-alkyl-4-quinolone (AQ) tired particles that management harmfulness in *Pseudomonas aeruginosa*. Here we have a tendency to explore a part of kynB within the creation of Aqs and harmfulness connected phenotypes of Burkholderia pseudomallei K96243, the specialist of melioidosis. Cancellation of kynB caused diminished AQ generation, swollen biofilm arrangement, diminished swarming and swollen resistance to antibiotic. Growth of exogenous anthranilic corrosive reestablished the biofilm makeup, nevertheless not per sister makeup. This investigation recommends the kynurenine pathway could be a basic wellspring of anthranilate and tired atoms that will direct *B. pseudomallei* harmfulness (Butt *et al.*, 2016).

Antibiotic resistance

The irritating characteristics of *P. aeruginosa* is its low antibiotic susceptibility which is attributable to multi drug efflux pumps encoded with chromosomally the antibiotic resistant genes. E.g., Mex AB and Mex XY. Some of the multidrug resistance development by *P. aeruginosa* requires genetic events like acquisition of horizontal transfer of antibiotic resistant genes and different mutations.

P. aeruginosa have been stated to retain efflux pumps of multi drug like Adf ABD and Adf DF efflux coordination that convey resistance in contradiction of quantity of antibiotic classes. A main feature recruited to be linked with antibiotic confrontation is decline in virulence abilities of resilient straining. Rifampicin resistant and colistin resistant strains have been reported in which decrease in quorum sensing have been documented. *P. aeruginosa* have the mutations in DNA gyrase which is linked with antibiotic resistance. Mutations when mutually joint with the others it confers the high resistance without obstructing the survival. Furthermore, in cyclic GMP signaling some of the genes involved that can contribute to resistance. These genes mutate repeatedly whenever grow in vitro conditions especially designed to mimic the CF lungs of the patient.

Prevention

Immuno- probiotic prophylaxis can inhibit colony of this bacterium and it can also delay the inception of *P. aeruginosa* infection in an ICU. Immuno-prophylaxis has been investigated against the genus *aeruginosa*. Risk of diminishing *Pseudomonas* infection can be decrease by escaping from warm tubs and pools and washing one's hands which is defensive in contradiction of some other pathogens. On the other hand, best hygiene can't be completely protecting a person against *P. aeruginosa* because this bacterium is very common in the environment.

Microorganisms

Microorganisms play a diverse role in the environment and are universal. They divulge numerous detrimental special effects like healthiness damage in addition to spoilage. Microorganism have also some beneficial role in production of bioactive compound, antimicrobials and it has also the involvement in pharmaceutical industries. In this universe microbes have been present for a long time about 4.8 billion years. (Gevers *et al.*, 2005).

Use of molecular methods for identification

Microbes found in surroundings can be isolated and regarded as by numerous culture dependent methods like spread plate, pour plate charted by Gram's staining. Some of the biochemical tests has been done to decode their physiological characteristics. Colony morphology on the growth medium by using microscope and some of the biochemical tests isolated the microbes that can be allocated to the specific genera. Conversely, these methods

are mainly depending upon the environment conditions and it also consume much of the time. (Rastogi and Sani, 2011).

In contrary to sequence based identification, PCR based identification is exceptionally sensitive and can distinguish a single target molecule it can be useful to culture independent samples. PCR fingerprinting methods permit perception of isolates that would otherwise not be discrete and it familiarizes less bias in contrast to culture charted by PCR. DNA fingerprinting method are applied to microbiological samples they cannot determine between living or lifeless cells and perceive nucleic acid. Chances of contamination and broad-spectrum priming may lead to wrong positive results. During ERIC, REP and other DNA fingerprinting technique, conditions e.g., quality of the DNA also the temperature of PCR can consequence in non-reproducible fingerprints. Henceforth, for genotyping and PCR some handling care and precaution must be use.

Gradient gel electrophoresis (a gel based technique) which is extremely useful for identification of microbial community both in uncultured and culturally available approaches as well because of their extreme sensitivity and high detection rate. This method is very appropriate and simple because nonradioactive fragments can be used for sequencing reactions and is readily isolated. This procedure is highly depending on accuracy of PCR and also its sensitivity because accuracy of PCR has greater impact on results and performance of this kind of electrophoresis. Correspondingly, genes which are remarkably rich in GC content cannot be evaluated easily by this method (Temmerman *et al.*, 2003).

Furthermore, when large DNA fragments are amplified there is decrease in sensitivity of results occurs and evaluated method has become a lesser amount of beneficial when amplicon size is more than 400bp. As genes targeted for identification purpose like 16S rRNA gene is of larger size, full sequence of these genes cannot be used for this purpose and inaccurate identification occurs. These procedures are not appropriate for enormously difficult societies (Gafan and Spratt 2005). Flow cytometry based recognition of microbes is progressive technique of revealing now-a-days when accuracy as well as detection time is concerned. Antibodies are presently altering the method in which we classify microorganisms, thus making it easier and more rapidly. Their specificity and usage of fluorochrome labelled antibodies to particular antigens decreases them one of the most powerful tools for the proof of identity of microscopic organism. Major disadvantages of this method against any microbial is limited availability of antibodies. (Gunasekera *et al.*, 2000).

There are basically known and unknown bacteria present in our surrounding it is impossible to develop antibodies against these bacteria which can severely limit this technique. This technique is useful for molecular determination of physiologically

important microbial and detection of targeted bacteria directly from our environment.

Protein profiling based identification system is more useful for samples and other groups which cannot be quantified based on their sequence variations. It is an entirely culture dependent training and group of bacteria which cannot be cultured in the usual research laboratory circumstances cannot be identified behind this practice. It is a time consuming process because long labelling incubation time required for this procedure. Correspondingly, use of MALDI-TOF MS for protein profiling is a costly methodology in addition to during esterification it is not precise to peptide bond of carboxyl terminal and is therefore lead to opacity in result. (De Bruyne *et al.*, 2011).

BOX-PCR

A gross of sixty-two *Pseudomonas aeruginosa* straining segregated as of two sick bay in (Polska) be there deliberate via tedious halogen constructed Polymerase chain reaction (rep-PCR) by means of BOX primer. BOX-PCR consequences exposed proximity of seven several geno-types and thirty-one unequalled arrangements amongst sequesters. In general straining of *P. aeruginosa* defined by means of status on the way to umpteen antibiotics proved also by dint of alterations in serogroups and categories of maturation on cetrinide agar line. Nonetheless *P. aeruginosa* straining stray on or after excrement exhibited untold change composition besides composition differences in similitude by means of straining attained as of remaining experimental samples. The aforementioned stayed perceived that hereditary procedures substantiated using phenotypic tests screw permitted to take careful classification of *P. aeruginosa* straining separate as of primary environs by component quantify. (Wolska *et al.*, 2011).

Genus *aeruginosa* isolate

Quantifiable segregates of *Pseudomonas aeruginosa* commencing diseased persons through CF are legendary in the direction of dissent as of individuals related by means of non CF congregations by association structure, mediate vulnerability arrangements and genetic hyper mutability. Genus *aeruginosa* segregates as of CF persons tally lasting established on behalf of their inclusive low range of anti-microbe's status but then their intracolonic MIC no uniformity extensive had disregarded. By means of two different associates of medical straining (224 as of 56 CF persons, 130 from 68 non CF persons) segregated trendy 2013 demonstrated sound E test MIC no uniformity in CF *P. aeruginosa* quarantines in compare to non CF *P. aeruginosa* sequesters. Proceeding groundwork of complete genetic sequencing of nineteen CF. *P. aeruginosa* sequesters as of nine persons through heterogeneous MIC set phyllo-genetic player habitual surrounded by person with CF *P. aeruginosa* clone stock end to end by means of sizable code succession changeability. Not one extra-chromosomal Deoxy-ribonucleic acid origins and formerly defined antiseptic status

transformations possibly will record intended for stretching separation on healthful MIC flanked by *P. aeruginosa* co-isolates and yet some in homogeneous transformations in eff-lux in addition to poring inheritable factor besides their supervisory body be located expressed. An exceptional Opr D order stood well-preserved between eld of sequesters of CF *P. aeruginosa* investigated portentous pseudomonal salutation to discriminatory compression that is communal to quarantines. Genetic order assemblage as well advisable that CF Pseudomonal hyper variability was not totally due to mutations in mutL, mutS, and uvr. We end that the net import of hundreds of reconciling mutations, both mutual between clonally relevant isolate pairs and undivided, accounts for their highly different MIC variances. We hypothesize that this no uniformity is indicative of the *Pseudomonal* syntrophic-like style low conditions of being "locked" inside a legion focal itinerary environment for prolonged periods (Qin *et al.*, 2018).

REP and ERIC PCR

Polymerase chain reaction grounded procedures of finger-printing hold benefit of proximity of tiresome arrangements that stay interspersed all through genetic assorted microbial kinds. Then countenance continual extra-genic palindromic (REP) succession enter microbial rep-entities intergenic consensus ordering (ERIC) in addition 154-bp BOX environs. Combining of target procedures was recycled meant for good favoritism of straining in addition to nominated as Rep polymerase necklace activity. REP PCR and ERIC PCR fuck stood revealed to valuable on behalf of key up *Aeromonas* straining. TO acquaintance Rep PCR finger-printing process expending BOX AIR priming had at no time stood proved in *Aeromonas*. In that muse BOX PCR finger-printing model stood assessed aimed at judgement of straining of any *Aeromonas* classes. Altogether straining stayed type-able in addition elf displayed unequalled adornment arrangements. Tetrad straining from civilization assortments be situated victimized inspect reliability of process. Bestowing to consequences BOX PCR finger-printing is applicative for type-writing of *Aeromonas* straining and can be considered as an expedient completing slave for epidemiology trainings of associates of that species (Tacão *et al.*, 2005).

Conclusion

Pseudomonas aeruginosa may be a common rod formed Gram negative microorganism found in surrounding, together with plants, soil and water. Its ability of changing into opportunist microorganism once there's a breach of host tissue barriers or suppressed system. It additionally vital healthcare facility pathogens of humans, principally inflicting infection in immune compromised patients like cancer patients undergoing therapy, severely burned patients and patients with mucoviscidosis (cystic fibrosis of the pancreas). It accounts for concerning 10%-20% of hospital uninherited infection that four-sided seen as blood disorder in medical aid units, mucoviscidosis, wound and burn infections. Burn infection has been a major cause of death in past few years. It is becoming difficult to treat it easily because of its

complexity and severity. It is reported that 2.5 million people in United States have burn infection each year and require intensive medical care. Out of these one lack people are hospitalized and more than 15,000 are died due to inappropriate care of thermal injury. Due to burn wound contamination natural cutaneous barrier is lost which permit more microbial colonization.

Hospitals in which non-heritable infections are significant public health threat. The incidence rate of burn wound infection has been increasing with the day. Several gram negative organisms grow on burn wounds and among them *P. aeruginosa* is common. Its non-heritable resistance against several normally used antibiotics for enhanced mortality and morbidity in healthcare facility infections is that resistance of these organisms against antibiotics normally active in hospitals for against of burn infection. *P. aeruginosa* has been a serious cause for infection in burnt patients. It causes death of variety of individuals in past. It's typical microorganism in healthcare facility infection. Its ability to grow in wet surround found within catheters and on burn wounds. It's additionally referred to as opportunistic pathogen of humans.

During this current study concerning thirty swab samples were collected from two different hospitals of Faisalabad like Allied hospital and DHQ hospital from different sites of burn patients. Samples were collected from different burn sites like legs, skin, arm, hands etc. throughout collecting of samples, history Performa was additionally filled from every patient and one sample was collected from one patient. The history Performa helped in analysis of antibiotic exposure standing of patients. The collected swab samples were incubated in Nutrient Broth for enrichment of culturing. The inoculated broth was incubated at 37°C for 24 hours. After twenty-four hours' incubation Broth that showed mistiness were designated for genomic DNA extraction.

For isolation, the enrichment broth samples were transferred to Nutrient agar plates by spread plate technique and incubated at 37°C for 24 hours. Once incubation was done then macroscopically presumptive of bacteria genus isolated was done on idea of colony morphology and pigment production. Out of thirty samples twenty-two samples were found to be presumably positive for bacteria genus. The positive samples were preceded for genomic extraction of DNA and PCR was performed and seen on Agarose gel. The objective of current study was to characterize the genetic profile of burned patients in elite of *Pseudomonas aeruginosa* consuming BOX primers. This study will help in to characterize the genetic relationship among *Pseudomonas aeruginosa* isolates.

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Effect Of Work Discipline And Work Environment To Performance Of Employees

(Case Study at the Central General Hospital (RSUP) Dr. Mohammad Hoesin Palembang)

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Abstract- *The purpose of this research is to examine and to analyse the effect of work discipline and work environment on employee performance (A study case Rumah Sakit Umum Pusat (RSUP) Dr. Mohammad Hoesin Palembang). This research used Multiple Linier Regression Analysis and the result indicated that work discipline and work environment has a positive and significant effect on employee performance (A study case Rumah Sakit Umum Pusat (RSUP) Dr. Mohammad Hoesin Palembang).*

Index Terms- *work discipline, work environment, and employee performance*

I. INTRODUCTION

In achieving the vision and mission of the company which plays an important role of human resources (HR). Human resources is an element of an organization that has a role in all activities of the organization. Important role of human resources is evidenced by the success of public organizations in the implementation of which is determined by the quality of human resources. Therefore, in human resource management should be such that it has the power to order to successfully accomplish the mission and goals of the organization or company.

It is important in managing human resources on employee performance. Performance is the work output somebody who carry out their duties in accordance with a given standard, both in quantity and quality. Employee performance is often defined as the achievement of the tasks which the level of organizational performance demonstrated through the conformity of the work program carried out by the employees to achieve the vision, mission, and goals of the organization. If a high spirit can be created from the employee, then the organization can run smoothly with supported something called performance affects directly or indirectly to human, then the work environment in an organization has significance to human activities in it.

General Hospital Center (Dr) Dr. Mohammad Hoesin is a state-owned general hospital in the city of Palembang. General Hospital Center (Dr) Dr. Mohammad Hoesin is a health care institution located Jl. Jend. Sudirman Km 3.5 Palembang 30126.

Employees for General Hospital Center (Dr) Dr. Mohammad Hoesin is the most important asset that should be owned by the company and is considered by management. Increased labor productivity is not an easy thing to do. Head of the organization or company is generally hampered by many obstacles in order to increase labor productivity that requires a specific approach in order to increase labor productivity, especially of the employees of the company itself (Pratiguna & Prasad, 2013).

Several factors can affect the performance of employees of them is the discipline of work and physical work environment. Based on the above background, encourage researchers conducted a study entitled "Effect of Discipline Work and Work Environment on Employee Performance (A Case Study **Rumah Sakit Umum Pusat (RSUP) Dr. Mohammad Hoesin Palembang**)".

II. IDENTIFY, RESEARCH AND COLLECT IDEA

A. Work Discipline

Labor discipline is a measurement used superiors to discuss with employees to change practices and behaviors in order to increase the willingness of employees to follow all the rules that exist in the company -aturan (Riva, 2011: 825).

Labor discipline is one of the important factors in improving productivity. However the high level of education and the ability of an employee, the amount of motivation given the leadership, nor the amount of the compensation will not mean much if the employees are not disciplined in carrying out their duties. Therefore, the discipline should factor is of great concern, both for the leadership and the employees concerned.

B. Work Environment

According to Robbins & Coutler (2011), the environment is the institutions or forces beyond that could potentially affect the performance of the organization. The work environment is a place that there is a group in which there are several supporting facilities to achieve its goals in accordance with the vision and mission of the company (Sedarmayanti, 2013: 23).

C. Employee Performance

Performance is the result of and quality to be achieved by employees in functions that are in accordance with the burden given by superiors (Mangkunegara, 2013).

III. RESEARCH ELABORATIONS

THE RELATION BETWEEN DEPENDENT VARIABLES AND INDEPENDENT VARIABLES

1. The Influence of Work Discipline (X1) On Employee Performance (Y)

Attitude is the most important disciplines in an organization. Without the support of employee discipline is good, then the company will be difficult to realize its objectives. with the maintenance of labor discipline, this will ensure the maintenance of order and encourage fluency in the task. Good discipline reflects a person's sense of responsibility towards the tasks assigned to him. This encourages morale, morale, and the realization of objectives of the company, employees and the community (Hasibuan, 2013: 193). The creation of a pleasant working conditions will encourage employee morale and impact on employee performance.

2. The Influence at Work Environemt (X2) On Employee Performance (Y)

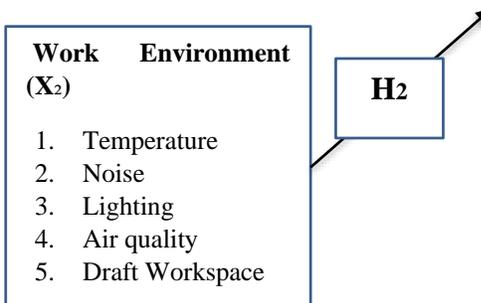
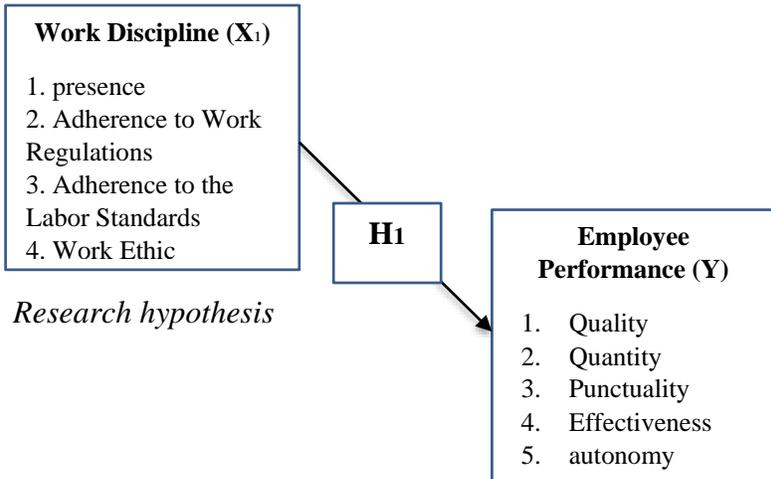
The working environment consists of physical and non-physical environment. Physical work environment settings such as the direction of light, color management, cleanliness, and others that will either improve employee performance. Supporting the work environment in terms of non-physical such as comfort and security as workers, relationship with your boss and coworkers are either dropped contribute to the effectiveness and efficiency of employees. Conditions conducive physical environment will menyciptakan pleasure, this may affect the employees to work harder and excited. High employee morale in the design of an efficient work system can be increased. Therefore, both conditions need to be improved in harmony so that both the work environment both physical working environment and non-physical is important for increasing employee performance.

Conceptual Framework for Thinking

Based on the theoretical basis that there is, then the conceptual framework of this study as follows:

Source: Data processed the author, 2019

There are six indicators to measure employee performance, namely (Robbins, 2006: 260): Quality, Quantity, Timeliness, Effectiveness and Independence.



Based on the background, the formulation of the problem, research objectives, the theoretical basis and theoretical framework. Then the hypothesis proposed in this study are:

H1 Discipline Work positive and significant impact on the Employee Performance in the Hospital Dr. Mohammad Hosein Palembang

H2 : Work Environment positive and significant impact on the Employee Performance in the Hospital Dr. Mohammad Hosein Palembang

RESEARCH AND METHODS

A. Types and Sources of Data

Data used in this study is qualitative data in the form of a questionnaire in kuantitatifkan statements by the use of a Likert scale. The data source premiere

B. Population and Sample Research

The population in this study were all employees of the department Dr. Mohammad Hosein Palembang totaling 2,807 people.

To determine the size of the number of samples used in this study, the authors use the terms Slovin. Slovin incorporating elements of leeway inaccuracy due to sampling error that can be tolerated. This tolerance value expressed as a percentage, such as 5% formula used is as follows:

$n = \text{sample size}; N = \text{population size}; \text{and } e^2 = \text{Tolerance inaccuracy.}$

$$n = 2,907 / (1 + (2,907 \times 0,1^2))$$

$$n = 96.67 (100 \text{ people}) * \text{Rounded}$$

So a sample to be used in this study was 100 people as respondents.

C. Data analysis method

Methods of data analysis used in this study is qualitative data obtained from questionnaires were quantified, which is then analyzed using multiple linear regression analysis.

IV. RESULT AND FINDING

Validity of Test Results

Below are the results of testing the validity of this research:

Table 1. Test Instruments Research

Test Validity research instruments

Indicator	product Moment Pearson's	Sign.	α	information
X1, 1	0391	0,000	< 0:05	invalid
X1, 2	0489	0,000	< 0:05	invalid
X1, 3	.566	0,000	< 0:05	invalid
X1, 4	.551	0,000	< 0:05	invalid
X1, 5	0617	0,000	< 0:05	invalid
X1, 6	.690	0,000	< 0:05	invalid
X1, 7	0,641	0,000	< 0:05	invalid
X1, 8	0,270	0,000	< 0:05	invalid
X1, 9	0605	0,000	< 0:05	invalid
X1, 10	0661	0,000	< 0:05	invalid
X2, 1	.540	0,000	< 0:05	invalid
X2, 2	0,488	0,000	< 0:05	invalid
X2, 3	.580	0,000	< 0:05	invalid
X2, 4	0591	0,000	< 0:05	invalid
X2, 5	.631	0,000	< 0:05	invalid
X2, 6	0,556	0,000	< 0:05	invalid

X2, 7	.294	0,003	< 0:05	invalid
X2, 8	0594	0,000	< 0:05	invalid
X2, 9	.598	0,000	< 0:05	invalid
X2, 10	0608	0,000	< 0:05	invalid
Y. 1	.484	0,000	< 0:05	invalid
Y. 2	0431	0,000	< 0:05	invalid
Y. 3	.466	0007	< 0:05	invalid
Y. 4	0,462	0,000	< 0:05	invalid
Y. 5	0504	0,000	< 0:05	invalid
Y. 6	.566	0,000	< 0:05	invalid
Y. 7	.448	0,000	< 0:05	invalid
Y. 8	0.593	0,000	< 0.05	valid
Y. 9	.598	0,000	< 0.05	valid
Y. 10	.381	0,000	< 0.05	valid

Source: Adapted from Questionnaire, 2019

Based on the above table it is known that each indicator (item) in the variable work discipline and working environment (independent variable) and employee performance (dependent variable) with a value of Pearson's Product Moment namely significance value of 0.003; 0.000 < 0.05.

Reliability Test Results

Here are the results of reliability testing in this study:

Table 2. Results of Test Reliability Research Instruments

variables	Cronbach's Alpha	Cutt Off	N of Items	Information
Work Discipline (X1)	0.733	> 0,60	5	reliable
Working Environment (X2)	0.734	> 0,60	5	reliable
Employee Performance (Y)	.710	> 0,60	5	reliable

Source: Adapted from Questionnaire, 2019

Of variable instrument reliability test results of this study, the reliability test results of labor discipline (X1) And working environment (X2) Generates the data obtained are reliable as Cronbach's Alpha value is 0.733, 0.734 and reliability test results of employee performance (Y) also shows the results are reliable because the value of Cronbach's Alpha is 0.710.

Normality Test Results

The test results can be presented as follows:

Table 3. Test of Normality

One-Sample Kolmogorov-Smirnov Test		
		unstandardized residual
N		100
normal Parameters	mean	.0000000
	Std. deviation	3.59863827
Most Extreme Difference	Absolute	.070
	positive	.062
	negative	-.070
Kolmogorov-Smirnov Z		.070
Asymp. Sig. (2-tailed)		.200

Source: Data Secondary, processed in 2019

Based on this research, it is known that the probability or significance value for each variable is greater than 0.05, so it can be stated that the data in this study normal distribution.

Test Results Multicollinearity

Assumptions multikolinieritas is a situation where there is a linear relationship is perfect or nearly perfect between the independent variables in the model.

The following test results multikolinieritas.

Table 4. Test Results Multicollinearity

<i>Test of Multikolinierity</i>	VIF		<i>Cutt Off</i>	Information
Work Discipline (X1)	1,423	<	10	Not Happen Multicollinearity
Working Environment (X2)	1,423	<	10	Not Happen Multicollinearity

Source: Adapted from Questionnaire, 2019

Based on test results multicollinearity, produce that is not the case multicollinearity between variables for generating VIF is less than 10.

Test Results heterokedastisitas

Heteroskedastisity test results in this study are as follows.

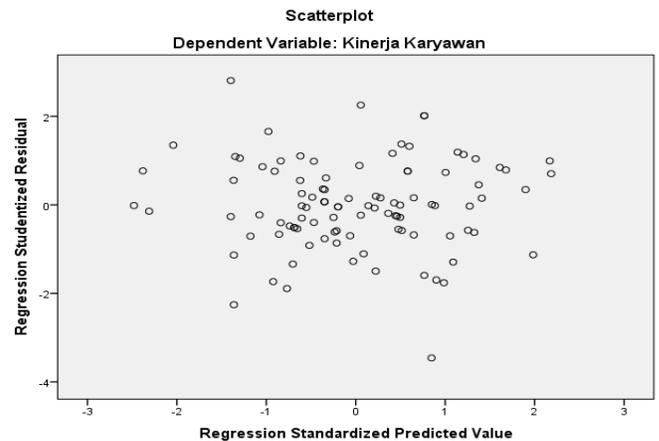


Figure Test Results Heteroskidastisity

Based on Figure above, suggests that the absence of heteroscedasticity, because the scattering of data form a specific line or not there is a clear pattern, as well as the points spread above and below zero on the Y axis.

Results of Multiple Linear Regression Analysis

Multiple linear regression analysis was conducted to determine the effect of work discipline variable (X1) And working environment (X2) On employee performance (Y). Based on test results obtained from the data as follows:

Table 5. Regression Test Results

<i>Test of Multikolinierity</i>	VIF		<i>Cutt Off</i>	Information	coefficients					
					Model	unstandardize d coefficients	standardize d coefficients	t	Sig.	
Work Discipline (X1)	1,423	<	10	Not Happen Multicollinearity	1	B	Std. Error	beta		
Working Environment (X2)	1,423	<	10	Not Happen Multicollinearity						

Source: Adapted from Questionnaire, 2019

Table 6. Test Results Correlation Coefficient (R) and the coefficient of determination (R²)

Constant	16 489	3,074		5,36 4	0,00 0
Work discipline	.227	0.075	.294	3029	0,00 3
Work environment	0.361	0.092	0.383	3,94 1	0,00 0

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0,597	.356	0.343	3636

Source: Adapted from Questionnaire, 2019

Source: Adapted from Questionnaire, 2019

Based on the results of Table 5, the results of multiple linear regression analysis can be expressed by the following equation:

$$Y = a + b_1X_1 + b_2X_2 + e$$

Based on Table 6 shows that the value of the correlation coefficient (R) between independent variables and the dependent variable amounted to 0,597, or by 59.7%, this shows that the correlation or relationship between independent variables and the dependent variable is quite strong and included in the range 0.40 to 0.59, Coefficient of determination (R²) Of 0.356 indicates that the independent variable is the work discipline (XR²1) And working environment (X2) Can explain the dependent variable is employee performance (Y) of 35.6%, while the remaining 64.4% is explained by other factors that are not be included in this study such as motivation, compensation, leadership and organizational culture.

ANNOVA^b

Model		Sum of Squares	Df	mean Square	F	Sig.
1	Regression	709 320	2	354 660	26 833	.000a
	residual	1282.070	97	13 217		
	Total	1991.390	99			

$$Y = 16.489 + 0,227X_1 + 0,361X_2 + 5.364e$$

The linear regression equation above can be explained as follows:

- The constant value of 16 489 indicates that if the absence of training variables and promotion, the performance of employees amounted to 16 489.
- Variable regression coefficient value of 0.227 keja discipline showed that if the work discipline variable plus 1 unit, the performance of employees will increase by 0.227.
- Variable regression coefficient value promotion of 0,361 indicates that if the work environment variables plus 1 unit, the performance of employees will increase by 0.361.

Results Correlation Coefficient (R) and the coefficient of determination (R²)

The strength of the relationship and the influence of independent variables and the dependent variable can be seen in the following table:

Hypothesis Test Results

Model Eligibility Test Result (Test F)

Based on test results and data processing with SPSS, the obtained test results F (simultaneously) as follows:

Table 7. Results of Simultaneous Test (Test F)

Source: Adapted from Questionnaire, 2019

Based on the results in Table 7, it is known values. Determined by the level of significance of 5% and the value Degree of Freedom (df) = k-1 = 2 and DF2 = nk = 100-2 = 98. Based on the value DF1 and DF2 = 2 = 98, then obtained a value of 3.09. Based on the test results in Table 4.13 F value > ie 26 833 > 3.09. This suggests that a significant influence and jointly between the discipline of work and the work environment on employee performance. $F_{table} < F_{table} < F_{table} < F_{hitung} < F_{table}$

Partial Test Results (t test)

Significance test (t test) aims to determine how far the influence of individual variables on the dependent variable. This study with a significance of 5% or $\alpha = 0.05$. T test results can be seen in Table 4:14 below.

Table 8. Test Results Partial (t test)

Suggestion

coefficients

Based on the research results the suggestions can be submitted the author as follows:

Model	unstandardized coefficients		standardized coefficients	t	Sig.	
	B	Std. Error	beta			
1	Constant	16 489	3,074	5,364	0,000	
	Work discipline	.227	0.075	.294	3029	0,003
	Work environment	0.361	0.092	0.383	3,941	0,000

1. Labor discipline determined by the Hospital Dr. Mohammad Hosein Palembang aims to give employees a sense of obedience to the regulations set forth. Based on the discussion of the expected results Hospital Dr. Mohammad Hosein Palembang in this discipline of work assigned to able to give employees a sense of responsibility to the duties and obligations. With the enactment of labor discipline, making the employees to comply with the rules that have been defined. This will impact the performance of the employee, if the employee does not discipline the employee's performance does not match what is expected of the company.
2. The working environment at the Hospital Dr. Mohammad Hosein Palembang on employee performance is able to provide working facilities and a good working atmosphere. Based on the results of the discussion, it is expected by the Hospital Dr. Mohammad Hosein Palembang in this case about physical work environment such as work support facilities need to be added and updated to make it easy for employees to perform their duties and obligations. In addition to the non-physical environment, fellow employees need to create a good relationship between them. The good relationship that is created create a sense of comfort and will result in better employee performance.
3. For further research to develop future research to add to the sample and the respondents that will be examined along with other variables to determine other factors that affect the discipline of work, work environment and employee performance such as motivation, leadership, ability kerja, job stress.

Source: Adapted from Questionnaire, 2019

Based on data in Table 8, the value Degree of Freedom (df) = nk = 100-3 = 97 and 0.05, t value table for this research data is 1.29034. The results of the analysis can be described as follows:

1. T value work discipline variable (X1) Is greater than t table is 3,029 > 1.29034 and the significance value less than 0.05 is 0.003 < 0.05. Positive t value indicates that the direction of labor discipline have influence on employee performance. These results suggest that the hypothesis of work discipline and significant positive effect on employee performance variables at Hospital Dr. Mohammad Hosein Palembang.
2. T value the work environment variables (X2) Is greater than t table is 3.941 > 1.29034 and the significance value less than 0.05 is 0.016 < 0.05. Positive t value indicates that the direction of the work environment has an influence on employee performance. These results indicate that the hypothesis of the working environment positive and significant effect on employee performance variables at Hospital Dr. Mohammad Hosein Palembang.

V. CONCLUSIONS AND SUGGESTION

Conclusion

Based on the analysis and discussion of the previous chapter, it can be concluded as follows:

1. Labor discipline positive and significant effect on the performance of employees at the Hospital Dr. Mohammad Hosein Palembang.
2. Work environment positive and significant effect on the performance of employees at the Hospital Dr. Mohammad Hosein Palembang

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From sandboxes to laboratories: evolution of wargaming into a method for experimental studies

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Abstract- The following article is an attempt at conceptualization of using wargaming as a proxy laboratory. This paper investigates the potential of wargaming as an experimental study by presenting the review of scientific wargaming and its predecessors from the discipline. Based on the literature review, multiple categories of wargames can be recognized with its own perspective on common parameters in specific scenarios. The review led to a preliminary taxonomy which can be derived from the categories paired with parametrization.

Four main parameters of the wargames are compared: the players (actors present in the conflict), the units (military), board (area of competition) and victory (conditions of winning). The parameters are listed alongside the scientific and professional wargames, providing a sample of state-of-the-art in the discipline. The comparison of wargames is paired with the identification of research gap, which leads to statement of essential research questions to be considered as attainable with the experimental studies.

The question on a structured method of designing the experiments remains opened due to high variability of chosen factors. Conclusions present the concept of applying the experimental study to the framework of wargaming. This concept can be applied further to deepen the understanding of research questions which require systemized trials. This article offers a point of reference which can be leveraged in future investigations by using the key common parameters alongside features of the experimental studies.

I. INTRODUCTION

2019 Nobel Prize in Economic Sciences has been awarded for the use of experimental approach to alleviating povertyⁱ by dissecting the complex system into specific, measurable set of research questions with accompanying real-life trials. Instead of projecting assumptions about possible solutions, the researchers have tested competing protocols towards improvement of the baseline (for example rate of vaccinations in Indian villages in intervention based on different incentivesⁱⁱ).

Using experimental studies to structure the framework of wargaming leverages the same approach to investigate range of outcomes in specific scenarios. Due to the hazardous nature of topics approached with wargaming, the methodology based on proxy laboratory is highly applicable. The main questions which wargaming is trying to answer have been evolving over time and the systematic review can provide a direction towards parameters and examples of previous use of specific protocol.

II. METHODOLOGY

Experimental study can investigate ways to identify commonly accepted assumptions and assess their validity. Within the discipline of wargaming, real-life experiments could raise understandable objections. In absence of in vivo trials, proxy studies have been established, as simulations or wargames. The following article provides a review of the concept of using experimental studies to address uncertainties. Wargaming addresses uncertainty by role-playing essential interdependencies, including different aspects of the conflictⁱⁱⁱ. The changes of parameters can be registered and examined, and at a later stage dissected into individual research questions.

The following section provides a sample of existing approaches to wargaming and the ways which they approached specific scenarios. It builds on the common parameters present in all cases, recognizing how the design of the system influences the experiment. The initial comparison investigates the players represented in the wargames, board delineating the area of competition, units which can be operated by the players and the winning conditions established as a determinant of success. This overview presents the table-top wargames.

A wargame is often referred to as a combination of 'game', history and science^{iv}. This combination is reflected in several disciplines which used wargaming as a methodology and the wide range of topics which it helped study. It is quite difficult to establish the basic assumptions of a still evolving discipline. This section will provide an insight into the origins of wargaming and the models prevalent in the practice. Within this review, it is clear that several authors have already pointed out knowledge gaps and need for alternative approaches.

III. LITERATURE REVIEW

The literature review is conducted based on Webster and Watson^v recommendations on capturing the relevant sources which shed light on the state of the art in the discipline and shows the gap which can be contributed to. Within the main databases of scientific publications, in the search conducted in May 2019, the results for the term 'wargaming' would yield respectively: 136 in Web of Science, 166 in SCOPUS and 202 in JSTOR. This reflects the two facts about wargaming discipline: it is relatively new and it remains largely undisclosed - much of the resources belong to governmental and commercial classified archives.

In the published articles, main clusters formed around technical application of wargaming rather than the concept which it followed. The categories in which the articles were grouped

were related mostly to: Computer Science Interdisciplinary Applications, Computer Science Theory Methods, Operations Research Management Science, Political Science, Engineering Electrical and Interdisciplinary, Management, History and Optics. The broad catalogue of disciplines employing the method shows that the approach is studied outside of the military sphere and applied as part of the analytical frameworks. It is often employed as complementary to other elements:

Wargames are synthetic experiences; to make the most of them, we need to integrate them with all the other tools (analysis, exercises, history, real-world experience) that we have available to help us make sense of what we can and should focus on in the present and the future^{vi}.

Such broad use of wargaming in multiple ways and within different disciplines and alongside other tools multiplied the ambiguities of the methodology, creating several versions of wargaming. This in turn produced many varying examples of making wargames, not as controlled instruments, but as a way of understanding a particular phenomenon. This rich practice base and a narrow codification point requires a separate description in order to view the existing system of wargaming.

IV. REVIEWING LITERATURE, PRACTICE AND HISTORY

Wargame in its academic purpose, has been defined as a model or simulation of war conducted without maneuvering actual forces and with a sequence of events that affects and is affected by decisions of the players^{vii}. The decision-makers draw from their experience and can relate the problems at hand to a form of reality. Starting from the beginning is challenging in the area of wargaming, as it can be traced to ancient times and all civilizations in its organized form. The oldest formal game has been found in the Royal Tombs at Ur dating back to 3000 BC^{viii}. The first of the recorded wargames was authored by Sun Tzu, called "Wei Hai" - encirclement, dated around IV century BC^{ix}. At the time, wargames were seen as the instrument of training royals and commanders in the art of war.

The most encompassing overview of history of wargames has been provided by Martin van Creveld in *Wargames: From Gladiators to Gigabytes^x*, where the author presented the games as following the structures and development of human groups (for example hunters, villagers, warriors – all playing to learn the skills required to survive).

The learning and knowledge building worked not only inside the social groups, but also outside - as games influenced popular culture. Examples of this can be found in the Ancient and Medieval Wargaming producing symbolic depictions like *Spartacus* and more entertaining games like *Field of Glory: Ancient and Medieval Wargaming^{xi}* and *Lost Battles: Reconstructing the Great Clashes of the Ancient World^{xii}*.

Historical examples of wargaming will be viewed through two perspectives: what time period they represent^{xiii} and how they address the four focus variables: Players (P), Units (U), Board (B), and Winning (W). Main differences in wargaming based on historical criteria could be summed up in the categories below^{xiv} (the period and topic can classify a wargame into more than one category at the same time):

1. Ancient Wargaming (3000 BC to 1500 AD) – representing the wars in Ancient Age reflects the most renowned conflicts of the time: Rome and Greece, Persians, Carthaginians, Huns, Celts, and numerous battles in Europe^{xv}. The clashes show amassed maritime clashes, mountain warfare, militarized cities such as Sparta, mercenaries as in Italian kingdoms, religious wars and imperial models of governance.

P: Alexander the Great, Hannibal, Julius Cesar; Egyptian, Nubian, Asiatic, Libyan, Hittite, Sea Peoples, Assyrian, Aramean (Syrian), Hebrew, Urartian, Median, Elamite, Babylonian, Scythian;
U: Hoplites, Roman legion, horse rangers, phalanxes and cavalry;
B: Greece, Rome, Byzantium, Middle East;
W: military victory - destroying enemy's army or capital city.

2. "Dark Age" Wargaming (600 AD – 1000 AD) – defined by the fall of the Western Roman Empire, represents the confrontation of barbarian tribes and civilization and a growing number of revolts, such as Jacobite in Britain^{xvi}. The tactical challenge includes countering quality with quantity, mobility and fortresses.

P: William the Conqueror, Vikings, Saxons, Germanic tribes, Romans, Arthur, Boudica, Aurelian, Huns, Magyars
U: shield walls, warbands (bands of infantry), cavalry, light troops, archers, swordsmen, spearman, axeman, crossbowman, war dogs,
B: Hastings, Macedonia, Europe, Byzantine Empire, Ireland
W: military victory - destroying enemy's army or capital city; uprising victory - defending territory against ruling (usually stronger) army;

3. Medieval Wargaming (1100 – 1400) – Representing the monarchy/class system and chivalry that arose as elite units. The role of knights and tournaments was a peak of tactical duel. By the end of the period, also farmers were assigned as fighting force. Although not limited by time in history, siege of royal cities constitutes a substantial part of Medieval Wargaming.

P: Saladin, Persia, Crusaders, Muslims, Kings, Joan of Arc;
U: knights, cannons, (english) longbow, horse archers, mercenaries;
B: Europe, Mediterranean, Wisby, Constantinople, Africa, Grunwald, Orleans;
W: military victory - destroying enemy's army or capital city; decapitation victory - defeating the king (usually in battle); siege victory - breaking through fortified defences of a city;

4. Renaissance Wargaming (1450 – 1650) – Also referred to as the Pike and Shot^{xvii} period, after the main weapons of the time. A comprehensive rule book for the renaissance wargaming has been compiled by Phil Barker and can be consulted for a detailed description of specific armies^{xviii}. The development of gunpowder and cannon has broken through the dominance of castle fortification and undermined the elite role of noble man and cavalry in battles. Tactical units include the cannons and early type rifleman.

P: Ottomans, Genoese, Venetians, Byzantine, Italy, China, Japan, Aztec, Christian, Protestant, Russia
U: cannons, riflemen, cavalry, pikes, dragoons, war wagons, ships
B: Crecy, Poitiers, Agincourt, Mediterranean, Varna, Italy, Europe, Africa, Americas

W: military victory - destroying enemy's army or capital city;
colonial victory - taking over rule of distant territories;

5. Horse and Musketeer Wargaming (1700-1860) – mostly marked by employment of regular armies and increased range of cannons. The period has mixed the cavalry of old type with new musketeers, starting a competition between maneuver and firepower.

P: France (especially Napoleon), Russia, Austria, Britain, Duchy of Warsaw, Dutch and Belgian, Germany and Prussia, Ottoman, Spain, Italy, Sweden, American (USA), Canada;

U: jager, musketeer, cannon, cavalry, hussars, artillery, general;

B: Waterloo, Warsaw, Nassau, Cartagena, Trafalgar;

W: military victory - destroying enemy's army or capital city;
colonial victory - taking over rule of distant territories;

6. Rifle and Sabre Wargaming (1860-1900) – industrialization and developments of the rifled weapons have led to marginalization of previously potent cavalry. The American Civil War is one of the predominant topics in this period, testing the battlefield tactics alongside societal issues like representation, North-South division and slavery.

P: Britain, Ottomans, America, Spain, Italy, Zulu, China;

U: sharpshooters, artillery, fileman, ships, infantry;

B: Sedan, Balaklava, American Civil War battles, Africa, South America, Panama;

W: military victory - destroying enemy's army or capital city;
colonial victory - taking over rule of distant territories;
independence victory - taking over rule of own territory (usually by native population);

7. Industrial period Wargaming (1900-1945) – both the scale and advancement of weapons have reached its peak. Most of the topical games include World War I and World War II within different fronts. The wargames conducted in the US and UK are often cited as innovative, as they have improved the tactics of convoys against submarines in real-life operations. The US Naval War College is marked as one of the most active centers, conducting 136 wargames between 1919 and 1941, mostly pitting US forces against Japan^{xix}.

P: US, UK, Germany, Russia, Italy, Japan;

U: Tanks, Artillery, airplanes, ships, submarines, motors, long-range missiles, intelligence units, infantry, snipers;

B: Africa, Europe, Pacific Ocean, Pearl Harbor;

W: military victory - destroying enemy's army or capital city;
coalition victory - winning as a group of nations against another enemy or group of thereof;

8. Cold War Wargaming (1945-1990) – Mostly representing the challenge of two dominant blocks and their proxies fighting for influence and ideological supremacy. This period does include a broader than earlier understanding of superpowers, economical regimes, espionage. Unique for this period, the feature of "Iron Curtain" dividing Eastern and Western blocks, provides insight into divided communities.

P: Soviet Union, USA;

U: spies, tanks, long-range missiles, nuclear weapons, infantry, satellite states (for influence);

B: Europe, Cuba, World;

W: military victory - destroying enemy's army or capital city;
coalition victory - winning as a group of nations against another enemy or group of thereof;

9. Nuclear Arms Wargaming (1945 -) – The employment of first nuclear bombs have shifted the range of possible solutions towards final annihilation ("burning the soil" was known since ancient times, but did not poison the territory with radiation). Later technological advances have provided the option of tactical nuclear weapons. This type of wargaming was most prominent at the peak of Cold War arms race. The renowned "escalation ladder" was developed for scenario-building in the 1960s. It is still recognized as an issue of value in relation to North Korea and Iran today. It also crossed to the popular culture within the board game: 13 Days: The Cuban Missile Crisis;

P: USA, Russia, India, Pakistan, Iran, France, UK;

U: Strategic nuclear weapons, tactical nuclear weapons;

B: Europe, America;

W: Nuclear victory - destroying the enemy and surviving its response; Deterrence victory - leading the enemy to believe that he cannot survive the first strike against and therefore keeping the peace intact;

10. Counterinsurgency Wargaming (1960 -) – This type of wargaming has come to high visibility during the Vietnam War. It recognizes the challenge of "human terrain" and losing wars even with numerical/resource superiority. As pointed out by theorists, a revolutionary war is 20% military and 80% political formula^{xx}. This disparity of goals and means has led to development of a COIN (Counterinsurgency) series of wargames depicting historical (Vietnam, Korea), and current (Iraq, Afghanistan^{xxi}) conflicts. Those often portray political movements and ethnic tribes alongside resources and forces in the area of competition.

P: USA, Viet Cong, Talibans;

U: guerilla, insurgents, infantry, air support, drones (since 2015);

B: Vietnam, Afghanistan, Iraq;

W: military victory - destroying enemy's army or capital city;
state-building victory - achieving stability and new government leading the country (in which the war took place);

Not established in the literature yet, but existing within practice, is the last category covering a range of activities which are related to gaming of peace. The combination of wargaming and peace in the name seems like a contradiction, but the two words refer to the topic (of peace) and the method applied (by using wargame), therefore actual.

11. Peace Wargaming (1990 -) – Although escaping the traditional outlook on wargaming, Peace games provide the de-escalation exercise to the public. Essentially, it is a reversed wargame, where the goal is to bring peace to an area (it can feature military means as well). Those wargames very often focus on one of the interventions of humanitarian and/or military actor and its challenges, revealing the additional layer of population needs (next to the military goals).

P: Military, government, population, international organizations, non-governmental organizations;

U: infantry, peace-keepers (UN, NATO), air force, local people, IOs and NGOs workers;

B: conflict areas, historical and current threats depicted on board;
W: comprehensive approach - majority of players reach a solution/improvement strategy;

V. EVOLUTION NOT REVOLUTION

As shown by the overview above, the categories of wargaming have been evolving with the new technologies used to fight the wars as well as some winning/losing conditions. The universe of wargaming is difficult to quantify or standardize towards a method. It is, however, built on several pervasive models of competition, which have been criticized as un-fit for investigations into current conflicts. Questions which are not included in the existing wargaming studies should be prioritized to contribute to filling the research gap.

VI. RESEARCH GAP

Wargaming existed since the dawn of times and the first sand tables with stones representing opposing forces. Over time, those models have evolved into multivariable analysis of the number, range and technological sophistication of the units. This numerical fidelity has increased the resolution of the models, but not the number of factors and concepts which influence the outcome. This limited view has been criticized by active personnel in the armed forces and governmental researchers:

- *Rather than always resorting to expressing simulation results in terms of kill rates and loss ratios, we should seek to paint a more comprehensive picture of the factors that make up victory or defeat. We should routinely think in terms of movement speeds, decision points, intelligence, command and control, deception, suppression, and morale. We will be aligning our simulations with battlefield realities instead of with analytically useful fiction^{xxii}.*
- *A key element of analytical work should be qualitative modeling, including cognitive modeling of the decision-making and behavior of commanders, political leaders, and even societies. Such modeling should be undertaken in an uncertainty-sensitive framework and can greatly enrich analysis while breaking down the barriers between "rigorous analysis" (usually quantitative, but rigid) and human gaming (often more realistic and innovative, but fuzzy)^{xxiii}.*

Among several recommendations for further development, the Human Dimension seems to be prevalent, considered as the source of high uncertainty in the modelling of warfare. Human factors have been identified throughout military science and often marked as "intangibles". Reluctance to develop new approaches has led to repeated mechanisms failing to address reality and perpetuated the "bottom-up" method instead of exploratory measures, showing the broad spectrum of uncertainties.

Another difficulty has been identified in the way that the results of the wargames are communicated. Specifically, the lack of understanding of plots, charts and graphs with the quantified results^{xxiv}. This applies to the data generated, as well as the need to visualize the impact of decisions made by commanders^{xxv}, to avoid being a black box with quantitative outputs that did not

readily translate to intuitive explanations or represent the qualitative data and relationships of importance^{xxvi}.

VII. EXPERIMENTAL WARGAMING CONCEPT

There is a limited published insight into scientific use of wargaming. This section therefore provides a break-down of using wargaming as an experimental study method. Experimental research has been formalized in several disciplines, due to two main reasons:

- 1) identification of variables that can be used in an experiment (as in the case of physics and psychology),
- 2) existence of research questions that are not answered by non-experimental methods (linked to causality in political science)^{xxvii}.

In case of wargaming, the variables which might be used include earlier identified number and nature of players, units, mechanics, board and winning conditions. The research questions which are suited for experimental study could be based on the change in those variables and the effects of the change for the system. The participation of humans in the decision-making process allows to answer questions which would not be suited for an automated simulation. It can also bring new questions within the exploratory wargames. These insights of the participants have to be waged against the epistemic dependence - experts dominating the overall design and not consulting with other sources^{xxviii}. Within wargaming, this can be aided by comparisons to real-life cases and extending the participants base to account for the biases. Davis proposed the Model-Game-Model Paradigm, which uses human as live feedback loop resembling the theory-test-theory scientific method for problems which are empirically unfeasible to test, such as crisis, nuclear war or escalating conflict.^{xxix}

With this initial concept principles, the experimental design of wargame can be proposed. Among the elements of experimental design, the following are enlisted^{xxx}:

- 1) Time series - identifying the elapsed time period;
- 2) Feedback - If the time series are connected with responding stimulus, it can be described in feedback loops;
- 3) independent variable - variable which is introduced to measure response to its levels;
- 4) dependent variables - those variables that are measured as response to the independent variable introduction;

Those elements are designed with focus on answering a research question, usually with a set of trials. The full collection of trials that addresses the current research question is referred to as an experiment^{xxxi}.

Using wargaming as an experimental study can: falsify a model by demonstrating that humans frame issues differently than is allowed for in the model, enrich a model by noting additional factors, creatively change the character of the problem, identify "frictions" that need to be represented in a realistic model^{xxxii}. This consideration alongside the identified research gap can serve as an indicator of research questions which can be chosen for investigation with this method.

VIII. CONCLUSIONS

The increasing use of experimental studies across different disciplines proves the validity of the method in many settings. The basic features, parameters and research questions suitable for the experiments have been sampled across this article. The categories of wargames can be further refined towards points of reference in future studies. This conceptualization of scientific wargaming also provides recommendations on innovative and long-lasting approaches tested throughout history.

The evolution of wargaming and its prevalence throughout human history represents a search for trial-and-error base for analysis of conflict. The concept of turning this long practice into a protocol which could be applied and validated is a necessary step towards emergence of scientific wargaming. Scientific wargaming

can leverage the established features of experimental studies to structure its method and findings.

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Endnotes

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- ^{xiii} As these challenges are infinite, author acknowledges that these categories represent a sample of existing and future wargames aimed at explaining differences rather than ordering the wargames.
- ^{xiv} Neil Thomas proposed categories based on differentiated units and mechanics over time. See more in: Neil Thomas, *One-hour Wargames: Practical Tabletop battles for those with limited Time and Space*. Pen and Sword Military, Barnsley, 2014.

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Impact of Effective Internal Control Implementation on Private commercial Bank's Financial Performance; Special Reference to Central Province of Sri Lanka.

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Abstract

Internal control system is a system design and implemented by the management to safeguard assets, ensuring accuracy and reliability of information and increasing the effectiveness of entity's operations. The need for the internal control system in Banks can't be undermined since the banking sector has a crucial role to play in the economic stability and rapid growth in real economic activities. Nevertheless, effective implementation of internal controls on private bank's financial performance is under studied. Therefore, the study investigates the impact of internal control components on Financial performance of private banks in the Central province of Sri Lanka. Internal controls are measured by the COSO Model of internal controls and five hypotheses were developed using components of internal control (Control environment, Control Activities, Risk Assessment, Information and communication, Monitoring). Financial performance measured based on scales used by previous scholars. The Sample of the study was selected using stratified sampling technique which comprises of 70 executive level employees from Private commercial banks in Central province. The study approach is quantitative and thus deductive approach and data was collected through questionnaire and hypotheses were tested using Multiple regression analysis. As per the multiple regression analysis control environment, risk assessment, information and communication and monitoring have the significant impact while control activities have insignificant impact on the financial performance of private Banks in central province. Based on the finding's researcher concluded that there is a need of much consideration on control environment, risk assessment, information and communication and monitoring which predict the financial performance of private Banks in central province.

Keywords: Internal controls; Financial Performance; Private Banks

1. INTRODUCTION

Internal control system is a vital role in every organization to achieve their management objectives. Internal control system can be defined as a system which has the features of maintaining the assets of a company and ensuring accuracy and reliability of information and reports related to accounting and other procedures and increasing the effectiveness of the operations Gündoğdu (2014). An internal control system which is created by management and implemented by management and employees is a process which is designed to ensure reasonable assurance to achieve specified objectives. In 1992, Committee of Sponsoring Organizations of tread way commission (COSO) developed a model for appraising internal controls. This model has been accepted as the generally accepted framework for internal control. The Company also maintains a system of disclosure controls and measures to ensure that information required to be revealed by the Company is recorded, processed, summarized and reported within the required time periods and accumulated and communicated to the Company's management to allow timely decisions regarding disclosure. Although these procedures are intended to identify and manage risks that could undesirably impact the achievement of the Company's business objectives, they do not provide unconditional assurance against material misstatement, errors, losses or fraud. (Dinesh Kumar, 2012, p. 58).

Banking sector in Sri Lanka plays a major role within the Sri Lankan financial system (Central Bank, 2018, P.345). The main objective of internal control system for Banks is to continuously track the accordance of all banking practices and operations with international auditing standards, banking laws, guidelines and rules to solve problems that may arise where required. In addition to this, with an effective internal control system, inaccurate, fraudulent transactions and irregularities are less to happen in Banks.

Due to the complexity of Banking transactions and many customers engage in banking transactions Banks can create vulnerable transactions of systematic nature. Therefore, there should be a soundness of Bank transactions which contribute towards maintaining stability in financial system in Sri Lanka. If banking sector collapsed the whole economy face to critical problem. The need for the internal control system in the organizations, especially Banks can't be undermined since the Banking sector which has a crucial role to play in the economic instability, slow growth in real economic activities, corruption and risk of fraud. (Olatunji, 2009, p.183).

Sri Lanka CID (Criminal Investigation Division) investigates Rs.40 million frauds at commercial Bank by altering data through fake debit card (News Desk, 2015). Investigation by Central Bank of Sri Lanka found that leak of customer data at HNB due to internal lapses (Economy next, 2017). interim financial released to CSE shows Internal fraud cost of NTB amounting to Rs.365 million during first quarter of operations ended in 31 /3 /2015 (Daily mirror, 2013).

Problem Statement

According to the background of the study its emphasis the importance of internal control in the Bank's Financial performance because banks contribute higher amount to the economic stability of Sri Lanka through banks in Sri Lanka. If Bank Financial performance increases, it effects to the economic growth by enhancing GDP. According to Gunawardhana (2014) shows the increasing of frauds within whole Banking system with the computerization of Bank operations has been increase gradually. The most serious problem hampering the smooth operation in public and private sectors at all the levels has been fraud, errors, defalcations, mismanagement and abuse of Banks. Fraud is really eating deep into the system and that any organization with a weak internal control system, is dangerously exposed to fraud. Control environment its enable to reducing the level fraudulent activities within organizational operation (Ayagre, Gyamerah, & Nartey, 2014) Internal control systems are put in place to ensure safe custody of all assets, detect and safeguard against probable frauds (Magu & Kibati, 2016) Even though every Bank tie with regulations and implement internal control within Bank how these kind of fraudulent activities can be happen which directly effect on Bank performance and it's a question whether there is an impact of internal control on financial performance of private commercial banks.

Most of the prior studies in performance intention were mainly focusing on managerial employees as well as non-managerial employees there are few researchers have found on direct impact of internal control on financial performance (Ayom, 2013; Dineshkumar & Kogulacumar, 2015; Douglas, 2012; Ilias, Abdulatiff, & Mohamed, 2016; Mahadeen, Al-Dmour, Beidat, & Tarhini, 2016; Shanmugam, Haat, & Ali, 2012) with exception to the Dineshkumar and Kogulacumar (2015) research which directly research on that relationship in Sri Lanka for the Tele communication industry above studies were oversea based. Therefor this research is given valuable base for future researchers. And, they are no research conducted to the central province of Sri Lanka regarding this research area. Therefor there is a research gap exist in Sri Lankan context as well as in International context.

When considering about dimensions those affecting to Financial performance researchers do not identified the same dimensions Yemer and Chekol (2017), Ndungu (2013), Mwachiro (2013), Mohomad (2018) identified dimensions of financial performance as Growth in revenue, Shabri, Saad, and Bakar (2016), identified profitability, In here cannot identify consistency of dimensions relating to the financial performance dimensions. It is an important problem observed in examining prior study. Therefore, due to the practical issues of control efficiencies and literature gap exist in relate to the internal control and its impact on financial performance of private commercial banks in Central Province of Sri Lanka lead to the identification of a research problem that is worth to study. The problem statement addressed in the present study: *whether there is an impact of Internal Control on Financial performance of Private commercial banks in Central Province of Sri Lanka?*

2.LITERATURE REVIEW

2.1. Internal controls

Internal control system is important for the smooth running of organizational operations. There are financial and non-financial assets that need to be efficiently and effectively controlled and monitored so that the organization can remain profitable and evergreen (Olufunmilayo & Hannah, 2018). "Internal Controls are processes designed and caused by those charged with governance, management, and other personnel to provide rational assurance about the entity goal achievement. About reliability of the financial reporting, effectiveness and efficiency of operations and compliance with appropriate laws and regulations" (Kinyua, Gakure, Gekara, & Orwa, 2015).

Corporate should be benefited from a better understanding of the interrelated connection among the components of internal control systems, which are integrated into the management process resulting in the maximizing shareholders' value. While all components of an internal control system are vital, a combination between them can lead to managerial excellence and effective governance (Koutoupis & Pappa, 2018). There are many empirical evidences which emphasize the requisite of internal control system in banking system. According to Adenugba and Adeyemi (2011) an insufficient internal control system often causes an inability to detect fraudulent activities and a decrease in the performance of banks. Research conducted by Gündoğdu, (2014) shows that internal control activities of the banks are adapted to the international standards in Turkey and effective control procedures exists in the banking system. In addition, efficient internal control mechanism has great impact on strong and stable outlook of Turkish banking sector.

Olatunji (2009) studied the impact of internal control system in banking sector and according to the findings the ineffective internal control system is the major cause of Bank frauds in Nigeria. It is then determined that the management of every Bank should generate and establish a standard internal control system, strong enough to stand against the tricks of fraud in order to promote continuity of operations and to ensure the liquidity, solvency and going concern concept of the Bank (Olatunji, 2009).

Amudo and Inanga (2009) identify the following six essential components of an effective internal control system; control environment, control activities, risk assessment, information and communications, monitoring, and information technology in their study. The findings of the study revealed that measuring effectiveness of internal control is concerned with the existence and functioning of the six major control components identified by the model. Internal control activities have been much important in Banking practices as the time passes. Furthermore, it is also worth revealing that modern internal control system approach has started to gain importance instead of traditional approaches and methods. It is also clear that the Banks have been trying to improve and put forward distance and central internal control practices through reducing centralized audit and control functions (Gündoğdu, A., 2014). The formation of internal control plays an important in prevention of fraud and irregularities. It is also a foundation for the conclusion that, management and relevant authorities should focus on more strategic ways of internal control establishment as a way to preventing fraud in the public sector (Ademola, I.S, Adedoyin, & Alade, 2015).

2.2. Dimensions of internal control

The COSO framework is built around five main control areas – control environment; risk assessment, information and communication, control activities and monitoring and corrective action. (Inusah & Abdulai, 2015).

Control Environment

The control environment is the one of the five components of the COSO framework and it is composed of the following five principles they are: Integrity and ethical values, Board of director's independency from management and oversight of internal controls, Organization structure, Attracting, develop, and retain quality employees, Management's control philosophy and risk appetite (Committee of Sponsoring Organizations of the Treadway Commission, 2013).

The heart of effective control is an emphasis on controls categorized as the control environment; management's philosophy and operating style, integrity and ethical values, assignment of authority and responsibility (e.g., accountability), human resource practices (e.g., training, performance appraisal, remuneration and compensation, employee counseling), audit committee, and internal audit (Inusah & Abdulai, 2015). Some of the control environment activities that an organization can undertake include; having an accounting and financial management system, management being committed to the operation of the system, management closely monitoring implementation of internal control systems in organizations, management providing feedback to the junior officers about the operation of the system and having appropriate measures to correct misfeasance in operation of the organization's accounting and finance management system. Further still, an organization's management should act with a great degree of integrity in execution of their roles, uphold ethical values in all management decisions, establish an objective, independent and active audit committee, and ensuring that the board of governors and its committees are independent of management (Kamau, 2014).

For cooperative organizations, the factors related to the control environment include the integrity and ethical values, commitment to competence of employees, management's philosophy and operating style, organizational structure, assignment of authority and responsibility, human resources policies and practices, and the activities of the board of directors or audit committee towards organizational objectives. (Mendoza, 2012). "Control Environment" the results indicate that integrity and ethical values, Code of Conduct and Flowchart are essential elements of the control environment. (Kinyua, Gakure, Gekara, & Orwa, 2015).

Control Activities

The next component of internal control system is control activities. When reviewing empirical studies researcher was able to define control activities as follows. Control activities are the policies and procedures that help ensure that management directives are carried out, for example, that necessary actions are taken to address risks that threaten the achievement of the entity's objectives (Nyakundi, Nyamita, & Tinega, 2014).

Control activities, whether within IT or manual system, have various objectives and are applied at various organizational and functional levels. Generally, control activities that are relevant to an audit may be categorized as policies and procedures that pertain to the following: Performance reviews (Nyakundi, Nyamita, & Tinega, 2014). These control activities include reviews and analyses of actual performance versus budgets, forecasts, and prior period performance; relating different sets of data, operating or financial to one another, together with analyses of the relationships and investigative and corrective actions; comparing internal data with external sources of information; and review of functional or activity performance, such as a Bank's consumer loan manager's review of reports by branch, region, and loan type for loan approvals and collections (Mary, Albert, & Byaruhanga, 2014). Most Bank employees believe that "Control Activities" is the policies and procedures, which are used to ensure that management directives are met. (Karagiorgos, Drogalas, & Dimou, 2012).

Risk Assessment

The third major component of internal control is risk assessment. Risks are the happenings that threaten the achievement of objectives. They finally affect an organization's ability to achieve its mission. Risk assessment is the process of detecting, assessing and determining how to succeed these things. There are both internal and external risks that could prevent the achievement of established objectives at the every level in an organization (Gamage, Lock, & Fernando, 2014). Risk assessment involves the use of systematic procedures to identify and analyze relevant risk and the subsequent management of those risks. Risk assessment incorporates the broader concept of "business risk," not just the risk related to fraud, error or misstatement in financial reporting. Risk assessment should include a strong focus on a cost versus benefit approach to control. (Inusah & Abdulai, 2015).

Some of the risk assessment indicators include; having mechanisms in place to identify and react to changes that can have dramatic effects on the operations; establishing controls for approving decisions regarding financing alternatives and accounting principles, practices and methods, assessing risks according to changes in the operational environment, analyzing the risks that may arise due to changes of new staff and determining the risks that are likely to be brought about by restructuring and establishing whether new services are likely to bring risks to the organization (Bett & Memba, 2017). "Risk Assessment" is considered as a key part of management process which is in place to identify and assess barriers to achieving Bank's objectives. (Karagiorgos, Drogalas, & Dimou, 2012).

Risk management in business it is sometimes referred to as Enterprise Risk Management (ERM), is the process of planning, organizing, leading, and controlling the activities of an organization in order to minimize the effects of risk on an organization's capital and earnings. Enterprise risk management expands the process to include not just risks associated with accidental losses, but also financial, strategic, operational, and other risks (Little, 2013). Risk management is about identifying all internal and external risks in the organization in terms of its significance, likelihood and cause, and establishing plans to prevent/reduce/avoid the occurrence of these risks. Risk significance is a measure of the magnitude of the risk effect if the unfavorable event were to occur. The effect is the ultimate harm that may be done or the opportunity that may be lost that should be quantified if possible. Likelihood is the probability that an unfavorable event would occur if there were no control activities to prevent or reduce the risk from occurring (Dionne, 2013).

Information and Communication

Information and Communication focuses on the nature and quality of information needed for effective control that the systems use to develop such information and reports necessary to communicate it effectively. Information is needed at all levels of organization to assist management in meeting the organization's objectives. (Gamage, Lock, & Fernando, 2014). According to the SLAuS,(2013) an information system encompasses methods and records that: Identify and record all valid transactions, Describe on a timely basis the transactions in sufficient, Measure the value of transactions in a manner that permits recording their proper monetary value in the financial statements, Determine the time period in which transactions occurred to permit recording of transactions in the proper accounting period, Present properly the transactions and related disclosures in the financial statements.

Information is needed at all levels of organization to assist management in meeting the organization's objectives. The information is used by inside parties as well as outside parties. This information should be communicated from top to bottom level that needs it in a form and within a time frame that helps them to carry out their responsibilities. Communication also use by outside parties such as customers, suppliers and regulators. Information about an organization's plans, control environment, risks, control activities, and performance must be communicated up, down, and across an organization. Reliable and relevant information from both internal and external sources must be identified, captured, processed, and communicated to the people who need it in a form and timeframe that are useful.

Monitoring

Monitoring can be defined as a continuing function that aims primarily to provide the management and main stakeholders with early indications of positive or negative progress, in the achievement of objectives. Monitoring helps organizations to assess the quality of performance over time and determine the efficiency of its controls. "Monitoring" most Bank's employees believe that Monitoring procedures are an inherent part of the Bank and are performed on a real-time basis reacting dynamically to changing conditions (Karagiorgos, Drogalas, & Dimou, 2012).

The purpose of monitoring is to determine whether internal control is adequately designed, properly executed, and effective. Internal control is adequately designed and properly executed if all five internal control components (Control Environment, Risk Assessment, Control Activities, Information and Communication, and Monitoring) are present and functioning as designed (Nyakundi, Nyamita, & Tinega, 2014). Monitoring is done to ensure that controls continue to operate effectively. For example, if the timeliness and accuracy of Bank reconciliations are not monitored, personnel are likely to stop preparing them. Monitoring of controls is accomplished through ongoing monitoring activities, separate evaluations, or a combination of the two (SLAuS, 2013).

Monitoring can be defined as a continuing function that aims primarily to provide the management and main stakeholders with early indications of positive or negative progress, in the achievement of objectives. Monitoring helps organizations to assess the quality of performance over time and determine the efficiency of its controls. Effectiveness of the internal control can be achieved through ongoing monitoring at each level of out. Furthermore, monitoring of the major risks should be the part of the daily activities of the all organizations along with the periodic evaluations (Abbas & Iqbal, 2012).

2.3. Financial performance

Financial performance is a measure of company's policies and operations in monetary terms. It is a general measure of a firm's overall financial health over a given period and can be used to compare similar firms across the same industry or to compare industries or sectors in aggregation. There are many ways to Measure Company's financial performance. (Kinyua, Gakure, Gekara, & Orwa, 2015). In the context of organizational financial performance, performance is a measure of the change of the financial state of an organization, or the financial outcomes that results from management decisions and the execution of those decisions by members of the organization. Since the perception of these outcomes is contextual, the measures used to represent performance are selected based upon the circumstances of the organization(s) being observed (Carton, 2004).

Impact of internal controls on financial performance

Positive financial performance in a firm can be achieved by eradicating waste in benefits services processes and systems. The "critical success factor" for a firm is the degree to which it fulfils its set objectives and mission in terms of being efficient, effective and economical. The information obtained from a sound internal control system as reflected from financial statements will provide a report on a firm's financial performance and position that is useful to a wide range of users for assessing the stewardship and making economic decisions (Doyle, Ge, & McVay, 2007).

According to thesis of Douglas conducted on internal control contribution on efficiency and effectiveness in Eco Bank Ghana limited revealed that internal control systems in Eco Bank Ghana Limited and the Banking sector in general. However, the effectiveness of the internal controls could not be described very effective since monitoring is less effective. (Douglus, 2012).

A study regarding "Internal control effectiveness & its relationship with financial performance ". The Results showed that Internal control effectiveness is strongest in private Banks, followed by public Banks and weakest in Islamic Banks, although the difference is not statistically large, but slight variation exists. Moreover, private Banks had a high level of financial performance; public Banks had moderate level of financial performance whereas Islamic Banks were found to have low financial performance. Hence it was concluded that internal control effectiveness has a positive relationship with the financial performance of the Banks (Khan, Shakri, & Chanar, 2015).

Empirical study on Effect of internal control on financial performance in an institution of higher learning in Uganda reveals that there is a significant positive relationship between internal control system (control environment, internal audit, and control activities) with financial performance (liquidity, accountability, and reporting) (Mawanda, 2008).

Another research carried out to find out the impact of internal control and financial performance of private and public organizations in Jaffna district revealed that perceived internal control has significant impact on financial performance. Further study identifies that control environment and information and communication negatively influence on financial performance while risk assessment, control activities and monitoring of the internal control lead to better financial performance (Murleetharan, 2016).

The assessment performed by a public accounting firm in connection with internal control over financial reporting process, provides a major impact upon the reliability of financial statements prepared by these entities and therefore can significantly influence investment decisions. Research results support the conclusion that the more effective internal control over financial is, the lower magnitude of fraudulent financial reporting can be settled (Spatacean, 2012).

Research article by named "A Comparative assessment of Internal Control System in Public and Private Universities in South-West, Nigeria" studied the comparative evaluation of internal control systems in public and private universities of Nigeria. The results of the analysis show that the control systems are not different in public and private universities (Akosile, 2013). Another study was designed to investigate the effect of internal control systems on the financial performance of sugarcane out grower companies in Kenya and all the Finance Managers and heads of internal audit for every out grower company were selected to take part in the study. The study found a positive significant effect of internal control system on the financial performance and concludes that internal control system helps increase performance of Sugarcane out grower companies (Mary, Albert, & Byaruhanga, 2014).

The research by namely "Internal Control in small and Microenterprises in the Vhembe District, Limpopo province, South Africa" investigated the efficiency of control systems in the SMEs, specifically in the Vhembe district in South Africa. According to the result, the efficiency of the control systems practiced by the small business sector was quite low satisfactory control systems. The findings of the research also suggested that small business should be encouraged and promoted to assist growth and expansion that will further enable increased efficiency of the internal control system. (Emmanuel & Agyapong, 2013).

Further research study investigates the effect of internal control systems on cooperative profitability. However, the researcher found that financial losses occurred in the cooperative, caused by inefficient cost control and not due to weak internal controls. Profitability can be improved with a new development plan as well as implementation of effective internal control systems within the cooperative. Good or strong internal control systems would influence the cooperative's profitability as well as help the stability and growth of the cooperative movement in Malaysia. (Shabri, Saad, & Bakar, 2016).

Conducted research study about "Effects of internal control system on the financial performance of remittance companies in modadishu-somalia" The study revealed that control environment, risk assessment and control activity significantly affect the financial performance of remittance companies in Mogadishu. (Mukhongo, 2016).

Empirical study aimed to investigate existence of a relation between the internal control system and financial performance of Telecommunication Company of Golestan province. Findings showed that there was significant and positive relation between internal control system and financial performance of the Telecommunication Company of Golestan province. Thus it can be said that existence of internal control system influences financial performance positively and an internal control system seems to be necessary for effective performance (Shokoohi, Saeidi, & Malekmahmoudi, 2015). According to another thesis its main purpose is to highlight the importance of internal control function, as well as their detailed presentation as imprinted and as experienced in the employees in Banks, to attempt an objective point of view, to draw some conclusions and to arise possible improvements and proposals on internal audit. Also, it aims to highlight the complexity and the nature of the Banking activity. Also, this study investigates the importance of the effectiveness of internal audit and internal control systems in the Greek Bank institutions. The findings of this survey guide us in drawing some conclusions as guidelines for the improvement of internal control and increase its effectiveness on Greek Banks (Paraskevi, 2016).

Hence, Abu-Musa (2010) investigates the existence and adequacy of implemented security controls of computerized accounting information systems in the Saudi Banking sector. The results of study reveal that the vast majority of Saudi Banks have adequate security controls in place. The results also enable Bank managers and practitioners to better secure their computerized accounting information systems and to champion the security of information technology for the success of their Banks.

Further, research conducted to investigate the "Effectiveness of internal control system in Greek Banking sector" within this framework of extremely fluid business environment, the purpose of our study was to underline the importance of a well-organized

internal control system for ensuring the safe and soundness of a credit institution's activity, and by this the stability of the Banking system as a whole. Further study revealed that results point out that all components of internal control is vital in the effectiveness of internal audit and consequently in the business survival and success (Karagiorgos, Drogalas, & Dimou, 2012)

According to another thesis that study focused and look at the influence of accounting information systems (AIS) for effective internal control on firm's performance and found out that when controls are operated efficiently and effectively, there will be improved performance, better accounting information reliability for better decision making for both the internal and external users and the control measures of effectiveness and efficiency of the information reliability will be boasted, effectual and improved operative goals and enhanced performance (Teru, Idoku, & Ndeyati, 2017).

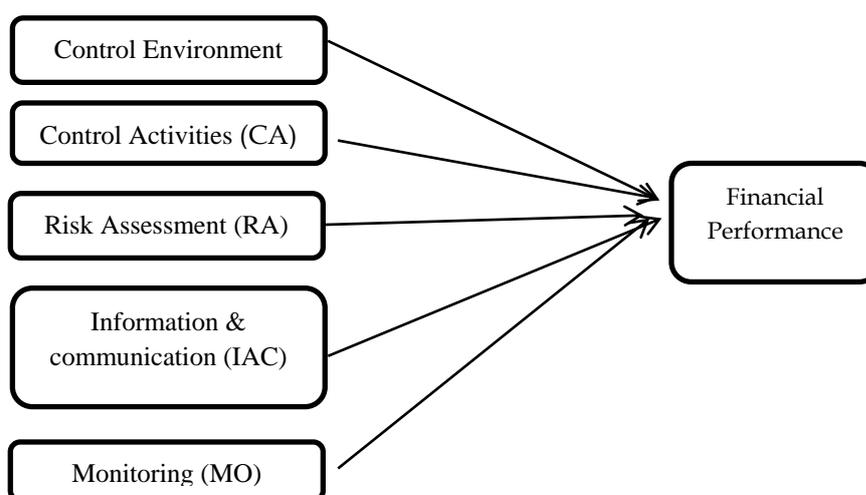
The study sought to determine the effect of internal control systems on financial performance of companies quoted in the Nairobi Securities Exchange (NSE). To achieve the objective of this study, the research specifically looked at the following objectives, control environment, internal audit, risk management, internal control activities and role of corporate governance controls on the financial performance of quoted companies in Kenya. The results and findings concluded that there was significant association between internal control environment and financial performance recommends that internal control environment should be enhanced to further improve the financial performance of companies quoted in Nairobi Securities Exchange. (Kinyua, Gakure, Gekara, & Orwa, 2015).

The overall objective of this study was to establish the effects of internal controls on the financial performance of manufacturing firms in Nairobi Kenya. This was achieved by looking at the effect of control environment, risk assessment, information and communication, control activities and monitoring on the return on asset of manufacturing firms in Kenya. Findings of the study showed that there is a significant relationship between internal controls and financial performance. Manufacturing firms that had invested on effective internal control systems had more improved financial performance as compared to those manufacturing firms that had a weak internal control system. (Njoki, 2015).

The research paper on the topic "Application of Internal Controls in NGOs: Evidence from Zimbabwe" investigated the degree to which NGOs in Zimbabwe implement internal controls in their procedures. The result of the study concluded that strong internal control structures are adopted by the NGOs in Zimbabwe with respect to control environment, Control activities and monitoring. (Ngwenya, 2013).

3. METHODOLOGY

The study is grounded on Committee of Sponsoring Organizations of Tread Way Commission (COSO) Model introduced by COSO committee in 1992 an modified in 2013. Through a comprehensive review of literature (Ayagre, Gyamerah, & Nartey, (2014); Ayom, (2013) ; Douglus, (2012);Dineshkumar & Kogulacumar, (2012); Kumuthinidevi,(2016.);Murleetharan,(2016); Gamage, Lock, & Fernando, (2014) the study identified five major independent variables Control Environment (CE), Control Activities (CA), Risk Assessment (RA), Information & communication (IAC) and Monitoring (MO) that may have effect on Bank's Financial Performance. Conceptual framework of the study is as follows;



Figure; Conceptual Framework of the Study (2019)

Base on the above independent variables five hypotheses were tested. The study collected data from 70 executive level employees Commercial and Sampath Bank which comes under the classification of systematically important private commercial banks which

bear highest turnover an asset base in Private Banks (Central Bank, 2018). This Population was selected because executive level employees have strongly alignment with internal controls, and they are involving in creation an implementation of internal controls. Researchers used solving's equation to decide sample size at 95% confident level and use stratified random sampling technique to select the sample of executive level employees though a population of 85 executive level employees in Private Commercial Banks in Central Province. A structured questionnaire was used in the data collection after considering expert opinion in revising the questionnaire and after a pilot study. The questionnaire was undertaken in English language. All closed ended constructs in the questionnaire comprised with various items on Likert Type five – point scales ranging from 1- strongly disagree, to 5 – strongly agree. Descriptive statistics, correlation analysis and regression analysis were employed in the data analysis.

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$$

Where Y=Financial Performance, α = Constant, β_1 CE = Control Environment, β_2 CA = Control Activities, β_3 IC = Information & Communication, β_4 RA = Risk Assessment, β_6 M = Monitoring

4.RESULTS & DISCUSSION

The main objective of this study was to empirically examine the impact of internal controls on financial performance of private commercial banks in Central province of Sri Lanka. Data were collected from 70 executive level employees selected from two districts (Kandy and Matale) through a pre-tested structured questionnaire.

4.1. Result of Multicollinearity

Table 4. 1: Result of Multicollinearity

Variable	Tolerance	VIF
Control Environment	0.799	1.251
Control Activities	0.641	1.560
Risk Assessment	0.496	2.017
Information & Communication	0.704	1.421
Monitoring	0.679	1.473

Source: Survey Data (2019)

To test the multicollinearity among independent variables tolerance value and variance inflation factor (VIF) value is calculated; it is generally believed that any VIF that exceeds 5 and a tolerance value lower than 0.10 indicates a potential problem of multicollinearity. According to the results in Table 4.1 the tolerance values are higher than 0.10 in private banks and the VIF values for each relationship falls in between 1.251 and 2.017 in private banks. Thus, there is no evidence for suspecting multicollinearity between the variables.

4.2. Demographic statistics of the sample

The total sample was categorized into seven categories under district, age, position, gender, and educational qualification, civil status, working experience.

Table 4.2: Demographic Statistics of the Sample

District	%	Gender	%	Civil status	%	Education qualification	%
Kandy	67.1	Male	84.3	Married	90	Secondary	1.4
Matale	32.9	Female	15.7	Unmarried	10	Certificate/Diploma	52.9
	100		100		100	Bachelor's degree	34.3
Age		Position		Working experience		Master and Above.	11.4
18-30	15.7	Manager	14.3	0-10	18.6		100
31-40	67.1	Assistant Manger	24.3	10-20	47.1		
41-50	17.1	Officer	61.4	Above 20	34.3		
	100		100		100		

Source: survey data (2019)

According to Table 4.2, out of 70 managerial employees 67.1% managerial employees are from Kandy district and rest of respondents represent the Matale district. When comparing gender distribution in private commercial banks, 84.3% of majority

represents male. Among four age categories most of the respondents of private commercial banks were under 31-40 age group which represents 67.1% and most of respondents were married which represents 90%. When considering this position, 61.4% represents officers in private commercial banks and managers were 14.3% which shows the lowest respondents in regard of position. When considering working experience in banks, 10-20 years range shows the highest respondents of 47.1% in private commercial Banks. Most of the respondents were certificate/diploma holders which represent 52.9% when considering the educational qualifications. Lowest level of respondents was secondary qualification holders in private commercial banks.

4.3. Results of Reliability Analysis

Table 4.3; Results of Reliability Analysis

Internal control	Cronbach's Alpha
Control Environments	0.799
Control Activities	0.826
Risk Assessment	0.838
Communication & information	0.751
Monitoring	0.680
Financial Performance	0.848

Source; Survey data (2019)

Cronbach's Alpha was used to assess the reliability and internal consistency of the data set. According to table 4.3, Results revealed that Cronbach's Alpha coefficient of over 0.68, showing a high internal reliability among the data gathered from the sample.

4.4. Descriptive statistics Results and Correlation analysis result

Table 4.4; Descriptive statistics and results of correlation analysis

Variable	Mean	SD	Skewness	Correlation	FP
CE	4.22	.51363	-.421	Pearson Correlation Sig. (2-tailed)	.648** .000
CA	3.92	.58907	-.303	Pearson Correlation Sig. (2-tailed)	.505** .000
RA	4.00	.57481	-.308	Pearson Correlation Sig. (2-tailed)	.696** .000
IAC	4.18	.47077	-.405	Pearson Correlation Sig. (2-tailed)	.580** .000
MO	3.90	.49432	.302	Pearson Correlation Sig. (2-tailed)	.535** .000
FP	4.29	.51224	-.584		1

**Correlation is significant at the 0.01 level (2-tailed).

Source; Survey data (2019)

Table 4.4 shows the descriptive statistics and result of correlation analysis. Mean values indicate that selected executive level has a favorable mind-set for the internal controls. In this study, since all the skewness values in Private commercial Banks are not exceed -1 or + 1 univariate distribution was normal. Standard deviation (SD) of Private commercial Banks shows values less than 1 which shows small deviations in responses given by respondents. In brief Mean and SD was used to determine the extent of spread of the data.

Further Table 4.4 revealed that all components of internal control system are positively correlated with Financial performance (FP) and there is a significant relationship between overall internal controls (IC) and the organization performance ($p > 0.05$). The Pearson correlation value for Control Environment and Financial performance was 0.648, Control Activities and Financial performance was 0.505, risk Assessment on Financial performance of Private commercial Banks was 0.696, Information and communication on Financial performance of Private commercial Banks was 0.580, Monitoring on Financial performance of Private commercial Banks was 0.535 and all were significant value is 0.000 ($p < 0.01$). These results are similar to the findings of previous studies on impact of internal control on financial performance. (Olufunmilayo & Hannah, 2018; Kinyua, Gakure, Gekara,

& Orwa, 2015; Adenugba and Adeyemi, 2011; Gündoğdu, 2014; Olatunji, 2009; Khan, Shakri and Chanar, 2015; Mawanda, 2008; Murleetharan, 2016; Spatacean, 2012; Shokoohi, Saeidi, & Malekmahmoudi, 2015).

Table 4.5.. Result of regression analysis

Table 4.5; Result of regression analysis

Adjusted R ² =0.699			F=33.121		Sig.=0.000	
Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
(Constant)	-.363	.391			-.929	.356
CE	.366	.076	.367		4.80	.000
CA	.040	.071	.046		.564	.574
RA	.293	.081	.329		3.61	.001
IAC	.238	.086	.219		2.77	.007
MO	.203	.081	.195		2.48	.015

a. Dependent Variable; FP

Source; survey data (2019)

Table 4.5 presents the result of regression analysis. This provides the idea about up to which extent the model is fitted. Regression model was fitted at sig value of 0.000 (p<0.05). Further, the Adjusted R² =0.699, this means 69.9% of the variation in Financial performance is explained by components of internal control remaining 30.1% of Financial performance of Private commercial Banks is described by other factors which are beyond in the study.

$Y = \alpha + \beta_1CE + \beta_2CA + \beta_3IC + \beta_4RA + \beta_4M$ Where, Y=Financial Performance, α = Constant, β_1CE = Control Environment, β_2CA = Control Activities, β_3IC = Information & Communication, β_4RA = Risk Assessment, β_4M = Monitoring

According to the table 3 four variables out of five are significant at either 0.01 or 0.05 while one variable is not supported. The results revealed that Control Environment (CE), Risk Assessment (RA), Information and communication (IAC) and Monitoring (MO) are statistically significant (p > 0.05). But control Activities is higher than the 0.05 and not statistically significant at either 0.01 or 0.05 on Financial Performance.

The univariate normality was assessed using skewness values. In this study, since all the skewness values in private commercial Banks were not exceed -1 or + 1 assume that the univariate distribution was normal. To check for linearity, researcher used the residual scatter plot. According to the residual plots, the observed residuals are not far above or below the normal line; thus, it can be assumed that the variables had linear relationships with each other.

4. Conclusion & Recommendation

This study found that financial performance is driven by internal control components Control Environment (CE), Risk Assessment (RA), Information and communication (IAC) and Monitoring (MO). Study found that there is a significant positive relationship with five components of internal control and financial performance. From that Control Environment (CE), Risk Assessment (RA), Information and communication and Monitoring (MO) have significant impact on financial performance of private commercial banks in Central Province of Sri Lanka. Researcher suggest maintaining and improve the existing internal controls in private banks to enhance the financial performance of private banks to enhance economic development in Sri Lanka.

Control Environment

Researcher recommended to organization's management to ensure and foster and maintain the highest standards of ethical behavior within the organization and implement awareness programs for employees and management staff to inform policies and procedures as well to sharpen their skills and knowledge with regards to implementation of internal controls.

Risk Assessment

Recommend conveying all employees about risk assessment practically, implement a fraud control plan for the Banks, which addresses relevant risk factors and is updated on a regular basis and undertake a fraud risk assessment (internal and external risks) at least once a year.

Information and Communication

Management should ensure it receives timely, relevant, and reliable reports for decision-making and that all relevant information is communicated to staff, all channels of communication are utilized by Company staff, and that there is quick and free flow of information in time such as introduction of internet based communication that can communicate with each other by being in anywhere in the world.

Monitoring

Further, enhance the existing supervision and conduct on going evaluation during the working hours within the Bank and should evaluate current performance with the expected outcomes and manager should improve the effectiveness of the internal control system in their Bank.

A major limitation of this research is the study is focus only on few private Banks. Also, this study includes conservation nature of the organization and the apathy of staff members towards providing information especially with respect to their internal operation policies and researcher will narrow down the sample to the central province Kandy and Matale district without conducting for whole commercial private Bank outlets in Sri Lanka.

Therefore, the researcher proposed some recommendations for future researchers who interested in this area, for the purpose of making some improvements. Researchers who related to this area are suggested to include more coverage areas or suggested to conduct a survey for the whole Banks, will increase reliability. Further, the number of participants in the survey was quite small. Further research should increase the number of participants and put more time in doing research that could improve the quality of the research. Further researcher proposes to consider moderating variable on internal control and financial performance such as cooperate governance in future researches to enhance the quality of outcome from the research study.

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The Influence Of Political Exposure In Digital Media To The Participation Of Prospective Voters For Demokrat Party In East Java Ahead Of The Election 2019

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Abstract: This study entitled the Influence of Political News Exposure in Digital Media to the Participation of Prospective Voters for Demokrat Party in East Java Ahead of the Election 2019. The aims of this study was to determine the influence and benefits of political news exposure in digital media to the participation of prospective voters for Demokrat Party in East Java. The method used in this journal was a quantitative method. The results showed that there was an influence of political news exposure in digital media to the participation of prospective voters for Demokrat Party in East Java ahead of the election 2019. It was seen from the equation which was interpreted without variable x, variable y has a value of 9.955.

Keywords: news, politics, digital media, political parties

INTRODUCTION

Communication is inseparable from daily activities in human life. It is based on human nature as a social beings who need each other. Both the interaction of individual communication with individuals, individuals with groups, and groups with groups. Like humans with each other connected through a chain called communication. Starting from human communication from those who do not know to know the information, from those who do not understand to understand when the communication runs effectively.

In his book entitled "*Communication Theories, Perspectives, Process and Contexts*", Katherine Miller (2005:1-2) says that a perspective is a way of looking at or seeing a particular phenomenon. In relation to the theory of communication science, perspective is like a lens through which we can see and observe a communication process.

In this study, the writer is interested in the discussion in the context of mass communication, mass communication is taken because of the current political inseparable in Indonesia's democracy, so many media plays a very distant role and it is quite effective in raising the electability of prospective candidates who want to fight in the election, because the fact of the mass media has the characteristic which able to reach the masses in large and broad, public and able to provide popularity to anyone who appears in the mass media.

Electronic mass media is growing rapidly and globally, digital media that stands out and needs the community to obtain various information, education and entertainment. From social media to website links of daily newspaper. Each newspaper certainly does not only carry a mission related to the interests of the company and the function of the press; but also shows the concept of certain news to attract and bind the reader. The variety of public assessment of the news concept presented by digital media shows that the news function is effective enough to foster a certain attitude to the readers. It means that the public reaction to news in the newspaper is a phenomenon of certain attitudes actualization that is directly or indirectly correlated with the news.

From a political perspective, mass media has become an important element in the democratization process because it provides an arena and channel for public debate, makes potential political leaders widely known to the public and also plays a role to disseminate various information and opinions. The role of mass media has been an important concern for society. Mass media has been the object of attention and regulation. The mass media is also become the object of research to produce mass communication theories. In the field of politics, determination of the democratic or undemocratic attitude of an organization or individual is increasingly dependent on the mass media.

To increase political participation certainly needs supporting factors in it, the writer in this journal choose the discussion about how digital media in political communication affects the achievement of political participation, for this journal the writer took the case of the influence of political news exposure in digital media to the participation of prospective voters for Demokrat party in East Java. Demokrat Party is a political party in Indonesia. The party was founded on September 9th, 2001 and was passed on August 27th, 2003. The party first participated in the General Elections in 2004 and received a vote 7.45% of the total vote and received 57 seats in House of Representatives (DPR). Here are Demokrat Party structure information. Through the coverage of online media from each news exposure, there is a positive and negative news, whether the news exposure can affect the vote in the electoral area of East Java VII. Here are some media that shows both positive and negative news from the two candidates.

Some temporary survey results in the effort to increase voters participation or electability with online media obtained from the Survey Institute conducted by Demokrat Party in the electoral area of East Java VII. The problem of voters participation or electability of Demokrat Party dropped, it is not because of the accumulative factor, including people in Demokrat Party are phenomenal people. With many problems occurring in the Internal party, making the community questioning back about the ability of this party. Communities in East Java generally participated in the election 2014. The general elections participants are not only consist of parents, but also the youth participated in the elections. People in East Java generally follow the development of information submitted by the mass media. With a lot of news about Demokrat Party made the writer interested in knowing the level of public confidence regarding the political participation of the vote obtained from Demokrat Party when it participates in the legislative elections in 2019.

Based on the descriptions of the background above, the writer formulated the problem in the study by focusing on the following question: 1) Is there any influence of political news exposure in digital media to the participation of Demokrat Party voters in East Java? 2) How big is the participation of Demokrat voters to the election?

LITERATURE REVIEW

Political Communication

Political communication is a political-characterized communication that takes place in a political system. Political communication can form the delivery of messages that have political impact from the political authorities to the people or the delivery of support or demands by the people to the political authorities. The term political communication is born from two terms namely "communication" and "politics". The second relationship of the term is assessed as intimate and privileged because it is in the political domain, the communication process occupies a fundamental function. However, communication approaches has helped provide a deeper and broader view of political behaviour.

Political communication is a conversation to influence in the country's life. Political communication can also be the art of designing what is possible (possible art) and can even be the art of designing what is impossible (impossible art) (Arifin, 2011:1). Littlejohn further in the theory of political communication explains the process of purpose in which elected leaders, the media, and citizens use the message to establish meaning about political practice. When people use the power to support the public interest, their messages and interactions are a strategic way to influence public policy (Rahman, 2018:1168).

From some of the above, clear political communication is a process of communication that has implications or consequences of political activity. This factor is also distinguishing by other communication disciplines such as education communication, business communication, intercultural communication, etc. The difference lies in the content of the 'message'. This means that political communication has a message that is politically charged, while education communication has education-laden messages. So to distinguish between one discipline and other disciplines in the study of communication sciences, lies in its nature or message. Political communication channeled the aspirations and political interests of the people into political system inputs. And at the same time political communication also channeled the policies taken or the output of the political system.

For example, in the presidential political campaign, it is now routinely and actively using digital media to reach out, involve and mobilize voters (Bimber & Davis, 2003; Foot & Schneider, 2006; Kreiss, 2012; Stromer-Galley, 2014). Social media limitations allow for rapid response, fostering communities that support and pushing their agenda to the national stage (Kreiss, 2012; Stromer-Galley, 2014). It is like in the process of political campaign that Barack Obama employs over 100 staff and invests \$47 million in social media outreach, which includes regularly posting political updates, monitoring these messages and communicating with supporters. As can be seen from this example and the recent developments, social media has become a critical domain of communication and political competition (Hsin. 2017:77)

In a democratic activity, it is undeniable that a campaign is an important thing to do, to gain public trust. It is as stated by Gronbeck (1978) and Norris (1999) who explains that the campaign has a variety of functions, including winning battle ideas, transforming and mobilizing supporters, providing supporters of claims and information topics, etc. This campaign is usually carried out through technology mediated communication channels (Jensen. 2017:22).

Then, the element in political communication is not different from the communication elements in general. Where basically consists of communicators (messenger), message, communicant (message recipients). And Nimmo in studying political communications involved elements of political communicators, political messages, political media, political audiences, and the consequences of political communication. Political communication is a political conversation involving elements of communication with certain political consequences (Nimmo, 1993:8)

The Concept of Political Participation

Participation is an important part of democracy, in which Huntington & Nelson (1976:3) suggest that political participation as a personal activity of citizens conducted to influence the government's decision. Then, Dahrendorf (2003) states that anyone who lives in a democratic country has the right to express their views and attitudes toward anything happening in the public domain or matters related to their interests in order to be known by Government and subsequently the government gave the response.

Democracy itself comes from the word *demos* and *Kratos*. That is, the pattern of governance comes from the people. It can also be the government (President) elected by representatives of the people. Meaning, the highest power is in the hands of the people. Democracy is developed to foster the participation of people, not the participation of individuals or groups. The role of people (read: public) is more appreciated because it plays an important role in making decisions for the public interest. For example, in determining a Regional Head, Regent, Governor, and President as Head of State in the system of democracy must be chosen by the people (Irawan, 2018:91).

The forms and frequency of political participation can be used as a measure to assess the stability of the political system and the satisfaction or dissatisfaction of citizens. Below are forms of political participation: 1) conventional by voting, political discussion, campaign activities, forming and joining interest groups, individual communication with political and administrative officials, 2) Non-conventional by petition submission, demonstration, confrontation, strike, political violence against property (destruction, bombing, combustion), acts of political violence against human beings (kidnapping, murder), and guerrilla warfare and revolution. So the political participation that focuses in this study is the concept of public political participation to vote in the implementation of the provincial legislative elections in East Java.

Concept of Mass Communication

Mass communication as a type of communication aimed at a number of scattered, heterogeneous, and anonymous audiences through print or electronic media so that the same message can be received simultaneously and instantaneously. The word "can" in this definition emphasizes understanding that the actual number of mass communication recipients at certain times is not essential. The communication experts agree that the meaning of mass communication is communication through the mass media, as it stands for mass Media communication (Amir, 1999:22).

According to Effendy (in Amir, 1999:23), in general, there are three functions of mass communication, namely (1) broadcasting information (to inform), (2) educating (to educate), (3) entertaining (to entertain). There are also experts that add functions other than the three functions such as the affect function (to influence), the guiding function (to guide), the critical function (to criticize); but it is only an addition to these three functions.

Meanwhile, people want to read and subscribe to the mass media, because basically human nature wants to know something that has been, is and will happen. In addition to events, information is also presented in the form of articles or other writings such as comments and editorial plans. All of that are intended to educate and influence others. Another form of influencing function is to present news or writings that are critiques in order to conduct social control. That is, by criticizing it is expected that the perpetrators change their behavior in a good direction. Furthermore, the perpetrators of misappropriation are given sanctions and penalties that have been felt to be deterrent and in the future does not repeat their mistakes. The main characteristic of mass communication is because it functions social control. It is done in order to uphold the truth and justice. Not to expose the ugliness and disgrace of others. Managing the press or the mass media according to the four function is a dilemma. When it does not carry out social control, it is considered to function as the press agency does not go well. Conversely, when conducting social control as ideally a press agency, the obstacles and challenges as well as threats are experienced. For the press people (read: journalists), dying and quitting work is a logical consequence, even judged respected if the cause is to establish the truth in the form of conducting social control (Amir, 1999:24).

News Exposure

According to McQuails (2002:387) as a media identity, it serves as a supporting authority of values and as a media socialization of the community. Communities consist of groups that each have their own values. Therefore, the magazine is published for certain groups of consumers. The editorial content and advertisements are deliberately adjusted to the target group. Because magazines can create their own markets for a product, the relationship between the magazine and its share is somewhat different. Contents of the magazine are more directed to the interest of the audience, because publishers do not want to take risks with content that is not necessarily acceptable. So the magazine deliberately provided itself to serve the audience. Thus magazines as one of the medium packaging for photography is a good medium to advertise due to circulation and the scope of its segments.

The categorization of magazine segment selection is very diverse. One form of a special segment magazine is a magazines that selects the target segment of the social class. The general characterization used to underlie segments of social class is usually socio-economic categorization. One of the potential segments but relatively few numbers is segments A and A+. This segment according to Weber belongs to the upper-upper, lower-upper-middle class category or Marx is the elite-bourgeoisie. One type of magazine that is the media of communication for this segment in Indonesia is the magazine "Indonesia Tatler" where photography in the feature (feature photograph) presented in this magazine tries to represent the value and lifestyle owned by the readers segment.

Concept of Elections

According to Sukarna (1981:83), it was stated that the election is a tool or way to obtain people's representatives who will fight for the interests of the people and be responsible for their success. According to Aurel Croissant and friends (2003:2) The elections are a necessary condition for democracy. Furthermore, according to Bintan R. Saragih (1988:167) suggests that elections are a sign of the will of the people in a democracy, with the general election of a country mentioning itself as a democracy in its true sense.

Christian Wulff's opinion is irrelevant to the increasing number of public participation in democratic activities. Then according to Dewey (1927) and Näsström (2003) states that democracy is based on the community and for the community. Due to a number of ethical and practical reasons, democracy is considered appropriate to involve the public in determining the joint to determine and change the situation. Thus all people have voting rights in the governance and process of development (Scholte, 2014:3). Then Mazzuca and Munck (2014) states that democracy offers solutions to problems related to the State (Wang and Yiqing, 2018:1).

According to Constitution No. 8 of 2011 about "General election organizer", article 1 paragraph I confirms that the election. General, hereinafter called election is the means of implementing the sovereignty of the people which is held directly, publicly, freely, confidentially, honestly and fairly in the unitary State of the Republic of Indonesia based on Pancasila and the Constitution of the Republic of Indonesia 1945.

In order to hold General Elections for Legislative Members, General Elections Commission (KPU) of Regency/city as stipulated in Constitution No. 8 of 2011 is explained that the General Elections Commission in Province and the General Elections Commission in Regency/city, then referred to as KPU Province and KPU Regency/City are the organizers of the provincial and Regency/city elections.

To better understand the concept of elections, we must understand the purpose, principles, and system of elections. 1) The purpose of elections is to elect representatives of people and district and to form a government that is democratic, strong and obtain the support of the people in order to realize the national objectives. 2) Principle of general elections. Based on the Constitution No. 8 of 2011 Chapter II of Article 2: The elections are effectively and efficiently based on a direct, public, free, confidential, honest and fair. 3) Then the system at the end there are two, first, election system used, district system: The system is organized based on the location of the electoral area, in the sense of not distinguishing the number of inhabitants, but a place that has been determined. Second, the proportional system is a system based on the number of people who will be voters, for example every 40,000 inhabitants of voters get a representative (balanced voice) while the chosen is a group of people who nominated by election contestants, namely the political parties are known by the mark of the picture so that representatives and voters less familiar.

Theory of Uses and Gratifications

This approach was first stated by Elihu Katz (1959) as a reaction to Bernard Berelson who stated that communication research on the effects of mass media was dead. The start of life is research on efforts to answer the question: "What do people do with media?" Because the use of media is one way to achieve the fulfillment of needs, the media effect is now considered as a situation when satisfying needs occurs (Rakhmat, 2004:199).

In the theory of Uses and Gratifications that the active audience to determine which media must be chosen to satisfy their needs. This theory emphasizes more on the human approach to seeing mass media. That is, humans have autonomy, the authority to treat the media. Blumer and Katz believe that there is not only one way for audiences to use media. Instead, they believe that there are many reasons for audiences to use the media. In this theory's opinion, media consumers have the freedom to decide how (through which media) they use the media and how the media will affect themselves. This theory also states that the media can have an evil influence on life. The use of this theory can be seen in the case of personal music selectivity. We select music not only because it matches the song, but also for other motives, such as for self-esteem, inner satisfaction, or just entertainment. The effort required to meet the needs is highly dependent on the availability or absence of media and the ease of using it.

Research of Uses and Gratifications started from the view that communication (especially the mass media) has no force to affect the audience. The core theory of Uses and Gratifications is that audiences basically use mass media based on certain motives. Media is considered to meet the audience motives. If these motives are fulfilled then the audience needs will be fulfilled. In the end, the media is able to meet the needs of audiences called effective media (Kriyantono, 2006:204).

Katz, Blumer & Gurevitch explained about the basic assumptions of Uses and Gratifications theory, namely: 1) Audiences are considered active, meaning that audiences as an important part of the use of mass media is assumed to have a purpose, 2) in the process of mass communication, the initiative to associate the gratifying needs with the selection of media lies in the audience, 3) Mass media must compete with other sources to satisfy their needs. The needs are fulfilled by the wider media. How these needs are fulfilled through media consumption is very dependent on the behavior of the audience concerned, 4) The purpose of mass media voters is inferred from data provided by audience members. That is, people are considered to understand enough to report the interests and motives in certain situations, 5) Assessment of the cultural meaning of the mass media must be deferred before being examined in advance audience orientation (Adrianto, 2004:71).

Antasaden includes individual variables consisting of demographic data such as age, sex, and psychological factors communicant, as well as environmental variables such as organizations, social systems, and social structures. The list of motives is not limited. But the operationalization of Blummer is quite practical for research guideline. Blummer mentions three orientations: cognitive orientation (need for non-information, surveillance, or reality exploration), diversion (the need for release from pressure and need for entertainment), as well as a personal identity (i.e., "using the media content to reinforce/accentuate something important in the life or audience situation"). The media use consists of the amount of time used in various media types of media content consumed and various relationships between individuals media consumers with media content consumed or with the media as a whole. Media effects can be operated as a media ability evaluation to provide satisfaction (Rakhmat, 2004:66).

Use of media content to obtain gratification for one's needs or uses and gratification, wrong theories and approaches often used in communication. This theory and approach does not cover or represent the entire process of communication. Because most of the audience's behavior is only explained through their needs and interests as a phenomenon regarding the process of acceptance (media message). The uses and gratifications approach is intended to describe the process of acceptance in mass communication and explain the use of media by individuals or individual aggregations (Effendy, 2000:289).

The uses and gratifications approach provides an alternative to look at the relationship between the media content and audience, and the categorizing of the media content according to its function. Although there is undoubtedly one or more models of uses and Gratifications, Katz (Effendy, 2000:290) illustrates the logic that underlies the approach of uses and gratifications: (1) psychological social condition of a person will cause it (2) needs, which creates (3) expectations (4) mass media or other sources, which lead to (5) different patterns of media use (or involvement in other activities) that will eventually result in (6) Fulfillment of needs (7) Other consequences, including those not previously expected. In addition to the basic elements above, the uses and gratifications approach often incorporates motive elements to satisfy the needs and functional alternatives to meet the needs.

The rewards here can mean rewards that were then also accepted (soon) or pending rewards. Rewards meet audience needs. For example, watching a program on a particular television because the media provides or satisfies the need for

information or entertainment. The effort required to meet the needs is highly dependent on the availability or absence of media and the ease of using it. When dividing a reward appointment with the effort required, it is obtained a selection probability from a particular mass media. Can understand the interaction of people with the media through the media use by the person (uses) and satisfaction obtained (gratification). The general gratification include an escape from fear, the appeasement of loneliness, emotional support, information acquisition, and social contact (Nurudin, 2011:193).

METHODOLOGY

This was a quantitative research. Quantitative research was a study that describes or explains a problem which results can be generalized, thus the study was not particularly concerned with data depth or analysis. In this quantitative research, the writer was more concerned with the aspect of data expanse so that the data or research results were considered a representation of the entire population. The study aimed to examine theories or hypotheses, supported or rejected theories. Data only as a means of confirming theory or theory proven by data (Kriyantono, 2006:57-58).

The hypothesis that will be tested in this study was H_0 , there was no influence on political news exposure in digital media to the participation of Demokrat Party voters in East Java. And H_a , there was an influence of political news exposure in digital media to the participation of Demokrat Party voters in East Java. In this study, the subject of study was digital media in the form of Facebook, Twitter and Instagram applications, the object in this study was the prospective voters for Demokrat Party in Ponorogo Regency, East Java. The consideration was that digital media was one of the most trusted sources and Demokrat Party in Ponorogo, East Java was the party's granary.

Related to this study, variables tested for proof of hypothesis were the size of the effect of digital media coverage (X) to the knowledge level of candidates for Demokrat Party in Ponorogo, East Java (Y). Therefore, this study used a quantitative approach or inferential research (hypothesis testing) and relied on a probability of rejection or acceptance of pre-compiled hypotheses. Another thing that can be used as a reason to use a quantitative approach in this study was because the data obtained in the form of numeric or numbers obtained from the filling out a questionnaire.

The sampling technique was done by Non Random Sampling. Non Random Sampling itself was a sampling technique that did not provided equal opportunities for each element or member to be selected into a sample due to the diverse population. Sampling was used because this study involved many elements in the population so it did not allow the writer to collect and test of each element of the population because it took up a lot of time, cost and energy. While the sample of this population was the village community of Pulung Ponorogo Regency with consideration of the main work were farmers and entrepreneurs market their processed products to be posted into the website.

Data collection techniques from this study, there are two techniques, the first was questionnaires. This study used survey techniques, while the instrument was a questionnaire. The questionnaire was a list of questions that must be filled by respondents, can also be called a questionnaire. The purpose of distributing questionnaires was to find complete information about a problem from the respondent without worrying if the respondent gave an answer that did not match the reality in filling out the questionnaire (Kriyanto, 2006: 93). And the second was secondary data, i.e. library data collection which was used to facilitate obtaining data, theories, research methods from reference books that were related and supported the study.

DISCUSSION

According to Ardianto and Erdinaya (2005:2), the exposure can be interpreted as the activity of listening, seeing, and reading media messages or having experience and attention to those messages that can occur in individuals or groups. Media exposure tries to find audience data on media use either media type, frequency of use and duration of use. The media use types includes audio and print media, audio-visual media and print media.

According to Hartono (2010:219), the value of r_{table} on α 0.05 is based on the Degree of Freedom (DF) = number of cases - 2. The number of cases in this study is 29 respondents, so DF is $29 - 2 = 27$, so $r(0.05; 27)$ in the one-way test = 0.367. If $r_{count} > r_{table}$ then the item is valid. This study is called valid because the instrument is exposed to the media and the level of knowledge on each question $r_{count} > r_{table}$ with r_{table} value of 0.367 while r_{count} value is always greater than 0.367. Subsequently held a realistic test, the study is said to be reliable when Cronbach's alpha value > 0.60 . In the variable media exposure, the writer find that the study is reliable because it has Cronbach's alpha value of 0.838 then the component of the questionnaire question regarding media exposure which is stated to be reliable with 5 questions. The Knowledge Level Variable of Cronbach's alpha > 0.60 is 0.715, so this instrument is reliable with 10 questions.

While the samples of this population is the prospective voters for Demokrat Party in Pulung Sub-district, Ponorogo Regency, East Java. From the population is 40 people, the writer take samples as many as 29 people. The responden data is used as a control variable (variable z). Variables that are involved in or provide a variable control of the media exposure to the level of knowledge. The majority of people in Pulung village Ponorogo has a high school (SMA) background of 62.1%. 20-29 years old the majority of people in Pulung village Ponorogo Regency (82.8%) is a productive age and age that is indeed the target of qualifying the Demokrat Party millennial voters. 51.7% of respondents work 6-8 hours per day and 6 respondents admitted more than six hours per day to work. From the previous respondent data can be known that the productive age to work so it is not surprising if the community of Pulung village has high working hours. 82.8% or as many as 24 people know in its working environment that the majority of farmers and entrepreneurs always update the information on the mass media. 93.1% of people in Pulung, Ponorogo know that facilities to get the latest information is available. Socio-cultural condition of village community of Pulung Ponorogo supports in accessing or searching for information as much as 89.7% of respondents answered yes. The respondent data will be used as a controller in the two other variables, namely media and knowledge level.

Knowledge variables consisting of the aspect of knowing and understanding that is found in the respondent who is the village community of Pulung, Ponorogo is moderate. It is seen in the above calculations. Based on research, as Laswell suggests

three kinds of communication experts, including journalists, namely: (1) environmental supervision, (2) correlation between parts of society in response to the environment, and (3) transmission Social heritage from one generation to the next generation. Wright made modifications and added a fourth category, namely Entertainment (Wright, 1985:7 – 8). Communication has several functions such as the following: a) entertaining. Communication is used to change one's attitude to be happier or more happy, B) to give information. Communication is done to change the condition of not know to know, or from know become increasingly know, c) to treat. Communication is used as an attempt to persuade someone to abandon his or her opinion and move on to a new opinion, D) Menstimuli. Communication is done as an attempt to convince a person to remain (Susanto, 1997:65).

The limited effects of mass media related to a community attitude that is selective in receiving the exposure to audience information can be divided into a passive audience and active audience. Passive audiences means the understanding which assumes that society is more influenced by the media. The community passively receives what the media convey, people directly receive what is conveyed by the media. While active audiences apply otherwise, these groups are more selective in receiving media messages, they are also selective in selecting and using Media (Littlejohn & Foss, 2005:333).

The frequency, duration, attention of viewing digital media such as Facebook, Instagram and Twitter, the majority is moderate (62.1%), then low (20.7%), and the frequency is only 17.2%. It can be concluded that the media which is happening is moderate. The frequency aspect of reading the minimum score is at a frequent answer and is always 20.7% with a frequency of 6 communities and the maximum score in the answer is rarely with a frequency of 10 people (34.5%). Village community of Pulung Ponorogo District saw Facebook, Instagram and Twitter less than 15 minutes of 16 people (55.2%). The majority of people in the village of Pulung Ponorogo said interesting (51.7%) And very interesting 17.2%. As for the content aspect of 58% of the Community village, Pulung Ponorogo agreed that the content of Facebook, Instagram and Twitter is interesting. Facebook, Instagram and Twitter content besides being interesting in its appearance and content, not forgetting of elements language and writing style. 55.2% answered interestingly and 6.9% answered very interesting.

In this study uses a simple linear regression analysis. If variable x increases by one unit then the variable y will increase by 0.46 units. Without variable x, variable y has a value of 9.955. This shows that without the news of digital media, the community knowledge level of Pulung Village, Ponorogo 0.46. Based on the equation it can be concluded that if the exposure to digital media is increased, the level of knowledge of people in Pulung Ponorogo regency will tend to rise or positive. Regression value (R) of 0.600. Corresponds to a value of R between 0 – 1. That means the influence that occurs between the two variables is positive value. It also means that the relationship between variables is strong, as R-value is closer to 1, the stronger the relationship between the two variables. Thus the influence between the exposure of political news exposure to the participation of prospective voters for Demokrat Party ahead of the election 2019 is strong.

While the coefficient of determination value (R²) amounted to 0.359. The coefficient of determination is used to determine the percentage of independent variable influence on changes in the dependent variable. This means that the influence of the two variables is 0.369 or 36.9%. Thus, the influence of political news exposure in digital media to the level of Community Empowerment of Pulung Village, Ponorogo Regency is great. The remaining 63.1% which affects the public knowledge level is another variable outside the news exposure variable. It acquired the value of Sig. 0.001. A comparison of Sig value. With the equivalent significance (α) will show acceptable initial hypotheses or not. According to the data $0.001 < 0.05$, which means the value of Sig. $< \alpha$. Thus the initial hypothesis is received, so that there is an influence on political news exposure in digital media to the participation of prospective voters for Demokrat Party ahead of the election 2019. Each aspect of the respondent's data, age, education, occupation, environmental and social culture, is calculated by its level of knowledge with SPSS.

From the data obtained by the majority there is no correlation between each variable and only social and cultural factors have a correlation. If a factor or control variable is included in the exposure variable and the knowledge level, the correlation value of 0.540. So it can be concluded that if the control variable is inserted in the variable x news exposure and y level of knowledge then the correlation value will tend to decrease compared if the correlation x news exposure and y level of knowledge is 0.600.

CONCLUSION

The results of this study shows that there is an influence on political news exposure in digital media to the participation of prospective voters for Demokrat Party in East Java ahead of the election 2019. It is seen from the equation which is interpreted without variable x, variable y has a value of 9.955. This shows if there is no political coverage in digital media, the community knowledge level of Pulung Village, Ponorogo Regency, East Java is 0.46. So it can be seen that if the number of the exposure is increased or greater then the level of knowledge is greater. Further acquired regression value (R) of 0.600. Corresponds to a value of R between 0 – 1. It means that the influence that occurs between the two variables is positive value. It also means that the relationship between variables is strong, as R-value is closer to 1 the stronger the relationship between the two variables. The next is produced H_0 proved, or there is an influence of political news exposure in digital media to the participation of prospective voters for Demokrat Party in East Java ahead of the election 2019. It can be seen from the results of the ANOVA test obtained the value of Sig. 0.001. A comparison of Sig value. With the equivalent significance (α) will show acceptable initial hypotheses or not. According to the data $0.001 < 0.05$, which means the value of Sig. $< \alpha$. In addition, the coefficient of control variable that can be significant effect is the social aspect of the culture is equal to 0.426. A 63.1% variable outside of the news exposure variable can occur due to a social-cultural control variable. Because by inserting a control variable in the knowledge-level variable it is less of correlation value of 0.540. The social variable of culture that is intended can be a habit of accessing the Internet as small. Culture to always update all information through various online media.

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Development Of Physics Learning Instruments With Guided Inquiry Learning Model By PhET Simulation To Train Student's Science Process Skills On Dynamic Electricity In High School

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Abstract- This research aims to: developing of physic learning instruments with guided inquiry learning model by PhET simulation to train student's science process skills on dynamic electricity in high school. The subject of this research is physics learning instrume with a guided inquiry model assisted by a PhET simulation to practice the science process skills developed and will be tested to class X in Muhammadiyah 3 High School Tulangan, academic year 2018/2019. This research consists of 2 stages, namely the first stage of developing learning instruments, and the second stage is testing the learning instruments in class. The development phase consists of four stages, namely the 4D development model (design, define, develop, dessiminate). The quality of physics learning instruments with guided inquiry learning models by PhET simulations which include: syllabus, lesson plans, student textbooks, student worksheets, and assessment after being validated by a validator can be declared as a valid, practical and effective instruments. Readability of student worksheets and student books obtained through a questionnaire can be seen that the aspects of attracting student worksheets by 86,7%, interesting appearance of worksheets by 86,7%, about the difficulty of explanation by 80% of students stated there is no difficult explanation, about the ease of understanding the illustrations/picture of 80% and about the existence of an incomprehensible statement of 83,3% of students stating there is no statement that is not understood, while in the student book it can be seen that the interesting aspect of Student Book content is 86,7%, the attractiveness of the appearance of Student Book is 86,7%, about the difficulty of explanation by 83,3% of students said there was no difficult explanation, about the ease of understanding illustrations/drawings by 86,7%. The average score of observations of the implementation of the lesson plan for all learning activities which includes: introduction, core, and closing range from 3,45 to 4 and in the good category. The reliability of the implementation of the lesson plan is 97,06%, the results show that the learning implementation plan with the guided inquiry learning model can be implemented well, by the developed lesson plan. Obstacles or obstacles found during the most dominant learning process are found in each learning activity both at the first meeting, the second and third virtual-based experiments (PhET simulations) so that sometimes time is less efficient it occurs because virtual-based experiments are a way foreign for students to practice their science process skills so that in this case need more guidance and supervision by controlling the student's experiment activities step by step, and reminding the problem of time so that not much time is wasted. And in each group it is recommended to divide the tasks, some conduct experiments and some do worksheets while still discussing/contributing opinions from one another. Also, several general factors hinder students' teaching and learning activities including the lack of support for learning space and inadequate facilities. Of how many common factors encountered have their solutions, but the most core solution lies in how the teacher reacts and acts according to the needs that should be done with all due consideration. Based on the results of the analysis, discussion, and discussion, it can be concluded that: The quality of the development of physics learning instruments with guided inquiry learning models by PhET simulation which includes: Syllabus, RPP, Student Textbooks, Student Worksheet, and assessment after being validated by the validator can be stated as instruments are valid, so that it can be used for guided inquiry learning models by PhET simulations on dynamic electrictricity material to train student's science process skills.

Index Terms- Development of Physics Learning Instrument, Guided Inquiry Learning Model, PhET Simulation, Student's Science Process Skills, Dynamic Electricity

I. INTRODUCTION

Physics is a branch of the science of nature that studies the basic elements that make up the universe, the forces at work in it, and its consequences, from this physics the development of information and communication technology that changes human life. Physics provides more dynamic methods in helping humans solve complex life problems. But in reality it was found that many students studying physics were not interested and did not have an understanding after studying physics. So educators must be more creative in presenting meaningful physics learning and the younger generation is interested in learning it.

Student interest in learning can be formed if students are actively involved in mental, physical, and social activities. In the 2013 curriculum, the benchmark of success in learning physics must be student-centered which focuses on students, not just the ability of teachers to teach. The quality of the process and student learning outcomes are determined by many factors, one of which is the availability of laboratory facilities for conducting experiments. Experimental activities are important in learning Physics because aspects of products, processes, and attitudes of students can be further developed.

Based on the results of a preliminary study in Muhammadiyah 3 Tulangan High School, there are several problems relating to learning, among which there are several obstacles in terms of student activities, (a) students are less involved in learning, so students cannot overcome problems that require authentic investigation, namely investigations that require resolution real from real problems (related to daily life). (b) the number of tools in the laboratory are damaged from year to year so that another alternative is needed so that students can still do practical work without having to damage the tools again, (c) the lack of training in the science process skills of students. Science process skills (KPS) are the ability of students to apply scientific methods in understanding, developing and discovering science. The skills of the process are observing, asking questions, formulating hypotheses, determining experimental variables, sorting the steps of the experiment, conducting experiments, analyzing experimental results data, formulating conclusions, communicating. These skills are needed so that learning does not tend to be monotonous in lectures and assignments that are charged to students, and is expected to be able to improve student learning completeness in this school which is less than KKM with completeness value 75.

The problems that occur above require a learning model that can present authentic problems and can train students' science process skills. In the guided inquiry learning model (guided inquiry) learning involves more students (student-centered), by the 2013 curriculum. The guided inquiry learning model can be the right solution because through guided inquiry learning will focus more on students. Students can conduct experiments directly through observation of a phenomenon. This can make students able to visualize abstract physics material.

The guided inquiry learning model consists of six stages, namely: (a) planning, (b) revenue information, (c) processing information, (d) making information, (e) communicating information, and (f) evaluating [1]. Guided inquiry has advantages, which are as follows: (a) the understanding obtained by students is usually deeper than the understanding of lectures and explanations; (b) teaching with this model tends to produce long-term retention and transfer compared to exposure; (c) implementing lessons with this model can give very satisfying results; (d) teaching becomes student-centered, one of the principles of learning psychology states that the greater the involvement of students in the learning process, the greater the motivation for student learning and achievement [2]. Guided inquiry is more appropriate to be applied in schools compared to free inquiry. Free inquiry requires students to have adequate initial knowledge for the material being studied, have a high scientific attitude, be active in experiments, and be able to process data so that they can eventually find a new concept. This type of inquiry is difficult to implement in classes with heterogeneous students. Dynamic electrical material is abstract physics material and has a high complexity, so students often have difficulty in understanding it, in this case, they need media that can describe something abstract, one of which is by using PhET simulations to simulate virtual experiments.

Physics Education Technology or PhET is a systematic endeavor that is responsive to the development of learning technology. PhET simulation is a moving image (animated), interactive and made like a game where students can learn by exploring. The simulation emphasizes the correspondence between real phenomena and computer simulation and then presents it in physical conceptual models that are easily understood by students. This simulation can describe abstract or invisible objects in the real world, such as electron atoms, electric fields and so on. Another advantage of the PhET simulation is that it can conduct experiments ideally, this cannot be done using real tools, besides this simulation is based on a java program that has the advantages of easy java simulations specifically designed to facilitate the task of teachers in making simulations physics by utilizing computers in accordance with their fields of science [3]. PhET simulation is very suitable to be used as learning support before students carry out the actual practicum. With the help of PhET, students will more easily recognize and learn the practicum to be carried out to minimize the possibility of students damaging tools when the actual practicum is carried out.

As the guided inquiry learning of PhET simulation also has a great influence in training student's science process skills, stating that student activity is above 80%, showing the learning done can activate students [4]. The percentage of students' perceptions was 91.03% indicating that they were very much in agreement with the learning assisted by PhET simulations. States that high school physics learning subjects of dynamic electricity using PhET simulation media and simple kits can run effectively [5], where students are generally interested in the content, media, and learning methods/models. The development research uses a guided inquiry learning model that is different from this study.

Science process skills (KPS) are the ability of students to apply scientific methods in understanding, developing and discovering science. The process skills are observing, asking questions, formulating hypotheses, determining experimental variables, sorting experimental steps, conducting experiments, analyzing experimental data, formulating conclusions, communicating. This science process skill is very suitable compared to the guided inquiry learning model assisted by the PhET simulation, students can compile their knowledge, develop higher skills, inquiry and independent students. This can be proven from several studies, that guided inquiry learning influences the science process skills of STIPAP LPP 2013/2014 students in Medan with a significant increase compared to traditional learning [6].

The research is also supported, that guided inquiry learning can improve student understanding and can train the science process skills of class XI science students of SMA Negeri 2 Kuta 2011/2012 [7].

The problems that occur above require a learning model that can present authentic problems and can train students' science process skills, due to the need for learning tools and simulations before actual practice is implemented to minimize damage to laboratory equipment, and inquiry learning model for high school students was developed. Second semester dynamic electrical material which is oriented on PhET simulation and will be developed in the syllabus, lesson plans, worksheets, student textbooks and assessment and observation instruments that allow educators and students to learn.

Based on the background, the researcher will develop learning instruments through research with development of physics learning instruments with guided inquiry learning model by PhET Simulation to train student's science process skills on dynamic electricity in high School.

II. EXPERIMENTAL METHOD

2.1 General Background of Research

The main purpose of this research to development of physics learning instruments with guided inquiry learning model by PhET simulation. The guided inquiry learning model consists of six stages, namely: (a) planning, (b) getting information, (c) processing information, (d) making information, (e) communicating information, and (f) evaluating. The resulting learning instruments include a syllabus, lesson plan (RPP), Student Activity Sheet (LKS) for Student Textbooks (BAS) and assessment instruments.

2.2 Sample of Research

The subject of this research is physics learning instrume with a guided inquiry model assisted by a PhET simulation to practice the science process skills developed and will be tested to class X in Muhammadiyah 3 High School Tulangan, academic year 2018/2019 on dynamic electricity material.

2.3 Instrument and Procedures

This research consists of 2 stages, namely the first stage of developing learning instruments, and the second stage is testing the learning instruments in class. The development phase consists of four stages, namely the 4D development model (design, define, develop, dessiminate).

2.4 Data Analysis

Data or information to be analyzed in this study include the data of the validity of the learning kit, observational data and student response data to learning, and the results of student's critical thinking.

a. Analysis of the Validity of Learning Instruments

Syllabus, lesson plans, student worksheets, and student books that have been developed will be reviewed by experts and practitioners to provide assessments. Data validation results were analyzed using qualitative descriptive analysis techniques, because the data obtained in the form of an average number (\bar{X}) from the results of the assessment of the validators were further categorized, to determine the level of validity of the assessment sheets developed by matching them with the validity assessment criteria as follows [8].

Table 2.1 Criteria for Categorizing the Validity Assessment

Score Interval	Rating Category
$\bar{X} \geq 4,65$	Very valid
$3,45 < \bar{X} \leq 4,64$	Valid
$1,15 < \bar{X} \leq 3,45$	Medium
$0,35 < \bar{X} \leq 1,15$	Less
$\bar{X} \leq 0,35$	Low

b. Analysis of Readability of Student Worksheets and Student Books

Analyst readability of the Student Worksheet and Student Book is done in a descriptive qualitative way by asking students to provide corrections regarding the readability of the Student Worksheet and Student Book. The results of student corrections are then based on positive and negative responses of students in filling out the LKS readability questionnaire sheets and Student Books.

c. Learning Implementation Analysis

Data from observing the implementation of the lesson plan were analyzed by calculating the average score given by 2 observers to the implementation of the steps in the lesson plan at each face-to-face. The score categories for each aspect observed are as follows:

- Score 0 – 1,0 : not good
- Score 1,1 – 2,0 : less
- Score 2,1 – 3,0 : good enough
- Score 3,1 – 4,0 : good

d. Analysis of Student Responses

Data or information about student's responses to learning is obtained by distributing questionnaires to students. Students respond to learning by choosing statements that are by their own volition which consists of 2 categories namely yes and no or is called the Guttman scale. Students answer Yes is worth (1) and students answer No value (0). Data were analyzed based on groups of respondents who answered: "Yes" and groups of respondents who answered "No". Mathematically it can be written as follows:

$$P = \frac{\sum K}{\sum N} \times 100\%$$

Information:

P : Percentage score of student responses

$\sum K$: Number of students who chose the answer Yes or No

$\sum N$: Number of students who filled out the questionnaire

The percentage of student responses converted with the following criteria [9]:

Figures 0% - 20% = Very weak

Figures 21% - 40% = Weak

Figures 41% - 60% = Enough

Figures 61% - 80% = Strong

Figures 81% - 100% = Very strong

e. Completeness Analysis of Student Learning Achievement

Data analysis of student learning achievement using qualitative descriptive analysis techniques aims to describe the completeness of student learning achievement (complete/incomplete). Data to be analyzed are pretest and posttest data. To describe the pretest and posttest data, the mastery learning reference is used by the Minimum Mastery Criteria, ie students are said to have finished learning if they have absorbed at least 70%, while classical completeness is achieved if at least 85% of students in the class have finished learning. The mastery of individual and classical learning is calculated by the following formula.

$$P_{individual} = \left(\frac{\text{number of indicators reached}}{\text{the sum of all indicators}} \right) \times 100\%$$

$$P_{classical} = \left(\frac{\text{the number of students who have completed}}{\text{the total number of students}} \right) \times 100\%$$

The completeness of each indicator is calculated using the formula:

$$\text{Completeness of the indicator} = \frac{\sum \text{students who reach indicators}}{\sum \text{all student}} \times 100\%$$

An indicator is complete when at least 70% of students reach the indicator. Achievement of basic competencies is calculated using the formula:

$$\text{Accessibility KD} = \frac{\sum \text{complete indicator}}{\sum \text{all indicators in KD}} \times 100\%$$

Ministry of National Education explains that students are said to have mastered basic competencies if the KD achievement is 100% or all indicators in the KD are complete. If the achievement of KD students >50%, students can learn the next KD by following the remedial for indicators that have not been completed. But if the KD achievement of students siswa50%, students can not learn the next KD.

f. Analysis of the Results of Science Process Skills Tests

Data on learning achievement of student's science process skills was obtained from performance tests in the form of student performance tests in conducting learning activities under the observation of two people. Students are said to be complete if the grades can meet the KKM or a value of more than 75. The aspects of science process skills assessed, namely the ability to formulate problems, formulate hypotheses, identify variables, analyze data and make conclusions. Students' science process skills are analyzed through the science process skills rubric.

g. Analysis for Student Response Data

Data about student responses were obtained from student questionnaire responses to learning activities and then analyzed using descriptive qualitative. The response data obtained are used to follow up on learning activities using the guided inquiry model. Analysis of student response questionnaire data using the Guttman scale. Students answer Yes is worth (1) and students answer No value (0). Then analyzed based on the group of respondents who answered "Yes" and the group of respondents who answered "No". And mathematically it can be written as follows:

$$P = \frac{\sum K}{\sum N} \times 100\%$$

Information:

P : Percentage score of student responses

$\sum K$: Number of students who chose the answer Yes or No

$\sum N$: Number of students who filled out the questionnaire

The percentage of student responses converted with the following criteria [9]:

Figures 0% - 20% = Very weak

Figures 21% - 40% = Weak

Figures 41% - 60% = Enough

Figures 61% - 80% = Strong

Figures 81% - 100% = Very strong

h. Analysis of Learning Obstacles

Constraints during the implementation of teaching and learning activities were analyzed with qualitative descriptive that is the observer and the researcher gave notes of the obstacles that occurred in the implementation of learning as much as two meetings accompanied by advice from the observer.

III. RESULT AND DISCUSSION

Based on the results of the analysis of research data and discussion of the discussion of research results related to the research questions obtained that syllabus is needed as a reference in developing lesson plans. Therefore, before developing the lesson plan, a syllabus must be available. learning (4,40), learning activities (4,50), time (4,00), tools and teaching materials (4,13) and assessment are (4,00) with valid categories and can be used with a little revision. This shows that the syllabus developed has fulfilled the existing components, as the syllabus rules are made according to Process Standards so that the syllabus that has been developed is feasible to be implemented with a few revisions. Learning Implementation Plan is a guide for a teacher in carrying out learning activities in the classroom that provides direction for student learning activities to achieve KD. The RPP is arranged by the development of learning instruments by PhET simulation. The aspects assessed from the validation of the lesson plan are (components of learning achievement (4,25), learning activities (4,38), time (4,00), learning instruments (4,50), presentation methods (4,38) and language is based on (4,00). Based on the data, it can be stated that the average value in the assessment of the validated lesson plan components includes the learning objectives component, learning activities, time, learning instruments, presentation methods and language with valid categories. Textbooks that have been independently developed by researchers who provide material reviews by KD and learning objectives. The development of this Student Textbook is motivated by looking at KD 5.1, which is formulating the electrical quantities of simple closed circuits (one loop) and KD 5.2, namely identifying the application of AC and DC electricity in daily life on current, voltage and resistance material. This textbook was developed from several references so it is easy for students to understand and understand. The textbook consists of: competency standards and basic competencies, introduction, concept maps of the objectives to be achieved and accompanied by examples of questions and exercises, science info, charts or pictures that support illustrations in the description of the material, experimental activities using tools and simple materials that can be done by students, material summary, references and glossary. There are three aspects assessed from BAS validation, namely: (1) content worthiness, (2) language, (3) presentation. Based on data, it can be stated that the average value of the validated Student Textbook components includes: the content eligibility component (4,18), the linguistic component (4,09), and the presentation component is (4,00) with valid category. Worksheets are developed as a guide for students to carry out experiments. The worksheet contains activities that train some of the science process skills taught including making problem formulations, formulating hypotheses, identifying variables, carrying out PhET simulations before experiments, compiling observational data, analyzing data and making conclusions on observations. Based on data aspects assessed by LKS, namely: guidance aspects (4,17), content eligibility (4,24), Science Process Skills (4,00), procedures (4,25) and questions of (4,00) with all valid categories. Learning objectives can be measured by using the achievement test/assessment test instrument Assessment test is equipped with a grid of questions. The grid is used as a reference so that the assessment test is by the learning objectives that have been set and each learning objective gets a portion of the questions to be tested. In addition to knowing the level of achievement of learning competencies, the assessment also serves as feedback for teachers in improving the methods, approaches, and learning resources used. There are three aspects assessed from validation of assessment, namely: (1) products and (2) science process skills. Based on data, it can be stated that the average value of each aspect of the product learning achievement test is (4,38) and the process is (4,18) with an average validation result of (4,21) valid categories.

LKS readability data and Student Books were obtained through a questionnaire. The results of student corrections are then based on positive and negative responses of students.. Based on the data table, it can be seen that the aspect of attracting the contents of the worksheet is 86,7%, attracting the appearance of the worksheet by 86,7%, about the difficulty an explanation of 80% of students stated there was no difficult explanation, about the ease of understanding illustrations/pictures by 80% and the existence of an incomprehensible statement of 83,3% of students stated there was no statement that was not understood. The results of the readability assessment of student books showed that the aspect of attracting the contents of student books was 86,7%, attracting the appearance of Student Books by 86,7%, about the difficulty of explanation by 83,3% of students stating there was no difficult explanation, about the ease of understanding illustrations/pictures amounted to 86,7%. The results of the assessment both on the worksheet and student book show that the instrument is interesting both in content and appearance and easy to understand, so the book is worthy of being used as a guide to help students in the learning process.

RPP implementation data is obtained through a questionnaire. The results of observers at 3 learning meetings. Based on the data table, observations of the implementation of this learning carried out at three meetings with the observed aspects include (1) introduction, (2) core activities, and (3) closing activities. From the observations of the data of the two observers obtained the average preliminary observations in three meetings of 3,65% with a good category, core activities which include planning an average of 3,65%, core activities consisting of six aspects, among others (1) planning an average of 3,62%, (2) getting information on average of 3,50%, (3) processing information at an average of 3,63%, (4) making information on average of 3,52%, (5) analyzing information on average 3,83%, (6) evaluating an average of 3,33%, and finally the closing average in three meetings was 3,66%, and the overall average of the introduction, core, and cover was 96,08% in the good category.

Data mastery learning indicators obtained from the provision of pretest at the beginning and posttest at the end of the learning

sequence. The data shows that the completeness of product objectives in the pretest has not been achieved, because the percentage of completeness of the product objectives is still below 75%. After carrying out problem-based learning with the help of PhET simulation, the posttest results showed that of the 20 product indicators there were 16 completed indicators or the completeness of the indicators/objectives of 80%. Unfinished product goals are goals 4, 10, 13 and 18 indicators. The number of students who finished at goal 4 was 21, at goal 10 there were 17 students and at goal 13 there were 19 students. Whereas for the 18th destination, only 15 students. The results of the pretest process skills include formulating problems, formulating hypotheses, planning experiments (identifying experimental variables), carrying out experiments, recording experimental data, analyzing data and drawing conclusions that no students have been completed, so completeness of process skills indicators is 0%, after learning based on the problem is aided by a PhET simulation, the posttest results indicate the completeness of the goal of problem solving skills is reached with a percentage of 100%. This shows that students can master the process skills well. Based on the description above, it can be said that the learning of incur mentor assisted by PhET simulation can improve the completeness of the objectives.

Data on the results of learning the aspects of product skills were obtained from giving pretest at the beginning and posttest at the end of the learning sequence. The data shows that the completeness of the objective aspects of knowledge in the pretest has not been achieved, because the scores obtained by students are below the KKM (75). After conducting guided inquiry learning assisted by PhET simulations, the average student score is above 75, only 6 students are incomplete out of 30 students, in the sense that there are 20% of all incomplete students, so the mastery of learning outcomes in a classical product can be said to reach 80%. The data shows that the average score obtained by students is below the KKM (75), so individually there are no students who complete it. After the learning process has been carried out, the average student scores above 75 only 5 students who did not complete out of 30 students in the sense that there were 16,67% of the total students who did not complete, so the mastery of learning achievement of the product can be said to be classically achieved (83,3%). The results of completeness of individual affective student values at the first meeting of 86%, the second meeting of 92,6% and the third meeting of 95,7% with an average percentage of 91,59%. This shows that the effective value of students is above 80% so it can be categorized as very high grades. Also, viewed from the reliability of the instrument at the first meeting that is equal to 92% while at the second and third meetings is the same that is equal to 95% with an overall average of 93,89%. This shows that the values are above 75%, so they are categorized as reliable.

The Ministry of National Education in 2006 explained that students were said to have mastered Basic Competence (KD) if all the indicators in the KD were complete. indicators in KD include formulating the problem, formulating hypotheses, determining research variables consisting of manipulation variables, response variables and control variables that use simulations, carrying out experiments based on PhET simulations, procedures in LKS, compiling observational data in data tables, analyzing data, drawing conclusions. The indicators in the KD in the pretest have not been achieved, because the scores obtained by students on average below the KKM (75), so individually there are no students who complete. After carrying out the development of a physics learning device with a guided inquiry learning model assisted by a PhET simulation, the process skills pretest results were obtained which showed that formulating the problem 80%, formulating the hypothesis 87%, determining the research variables consisting of 77% manipulation variable, 87% response variable as well as control variables that use a 90% PhET simulations, carry out experiments based on a PhET 90 simulations, 90% LKS procedures, compile observational data in 90% data tables, analyze 93% data, draw 87% conclusions, pretest results do not most students master all basic competencies. The total number of 30 students was only 5 remedial students or 83,33% of students were complete. The results of indicators in KD, as a follow-up, the 5 students are allowed to learn the KD further, after participating in remedial for indicators that have not been completed. The Ministry of National Education in 2006 explained that students were said to have mastered Basic Competence (KD) if all the indicators in the KD were complete. Most students master all basic competencies and the total number of 30 students was only 5 remedial students or 83,33% of students were complete. As a follow-up, the 5 students are allowed to study KD in the future, after taking remedial for incomplete indicators.

The results of the analysis of student responses shows that 89,45% of students feel attracted to the components (teaching materials, Student Books, worksheets, learning atmosphere, exercises with the PhET media and the way the teacher teaches), while several 10,55% of students expressed less interest. Student responses to the renewal of the component indicate that 90% of students stated new. Whereas 10% of students said that they were not new. Student responses to the development of the device and the implementation of learning during the trials showed that 91,33% of students stated new things while 8,67% of students stated that it was not easy, thus almost all students said the components were easy to understand. Student responses to the renewal of the process skills component showed that 95% of students stated new things, while 5% of students stated not new. Thus almost all students stated that the process skills component was new. 84% of students responded that the process skills component was easy to follow during the learning activities, while 16% of students stated that the process skills component was difficult. Student responses using PhET applied to the next subject and applied to other subjects are 93,33%. The students' responses to the teacher's explanation at the time of the KBM took place and the teacher's guidance when working on the worksheet stated that 90% were clear while 10% of the students stated unclear or unclear. Several 86,67% of students responded that the items tested were easy, whereas, in terms of the updating of the items, 88,33% of students stated that the items were new, while 11,67% of the other students stated that the items included were lacking or not new. This is because the items are not only in the form of theoretical tests but also in the form of process performance tests.

During the implementation of the PhET guided simulation learning model, several obstacles were encountered. All learning activities both at the first, second and third meetings are held based on virtual experiments (PhET simulation) so that sometimes time is less efficient. This obstacle is overcome by guiding, controlling students' experimental activities, and reminding the problem of time so that not much time is wasted. In each group, it is recommended to divide tasks. Some conducted experiments and some worked on student worksheets (LKS) based on PhET simulations while still discussing/contributing opinions from one another. The second obstacle is the implementation of science process skills tests requiring sufficient laptops/computers for 30 students while supplies are limited. This obstacle is overcome

with the test divided into 2 sessions. The third obstacle Not all computers can function/work optimally when used. This obstacle is overcome by choosing which computer positions are more and more supportive to use

IV. CONCLUSION

Based on the results of the analysis, discussion, and discussion, it can be concluded that: The quality of the development of physics learning instruments with guided inquiry learning models by PhET simulation which includes: Syllabus, RPP, Student Textbooks, Student Worksheet, and assessment after being validated by the validator can be stated as instruments are valid, so that it can be used for guided inquiry learning models by PhET simulations on dynamic electricity material to train student's science process skills.

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Development Of Guided Inquiry Learning Model By Articulate Storyline Media On Elasticity Materials To Increase Student's Motivation And Learning Achievement

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Abstract-The aim of this research is development of guided inquiry learning model by articulate storyline media on elasticity materials to increase student's motivation and learning achievement. This research type is development research, researchers develop instrument that produce certain products that include syllabus, lesson plans, student activity sheets (student worksheets), student books, and knowledge learning test results. The subject of this research is the instructional guided inquiry learning model by articulate storyline media while the test subjects are 60 students divided into 2 classes, namely X MM 1 and X MM 2 at SMK Al-Amin Surabaya in Academic Year 2019/2020. This research development of guided inquiry learning model by articulate storyline media was carried out through two stages, namely the development phase of the learning instruments and the testing phase of the learning instrument. Based on the research results of the development phase and the trial phase II that has been carried out on 60 students of X-MM class of SMK Al-Amin Surabaya it can be concluded that: (a) Guided inquiry learning model by articulate storyline media on elasticity material consisting of syllabus, lesson plans, student worksheets, student books, and knowledge test sheets have met the validity requirements of a learning instruments. (b) Guided inquiry learning model by articulate storyline media on elasticity material that has been developed otherwise practical. This is seen from the implementation of learning that gets an average of > 3.00 , positive student activity increases at the next meeting, and obstacles that occur during the learning process can find alternative solutions so that learning objectives are still achieved. (c) The instructional guided inquiry learning model by articulate storyline media on elasticity material is declared effective. This is observed from the increase in student learning achievement after learning using the developed learning instrument, in addition to that student motivation also increases. Based on the conclusions above, it can be concluded that in general the development of guided inquiry learning model by articulate storyline media on elasticity material to increase student's motivation and learning achievement.

Index Terms- Guided Inquiry Learning Model, Articulate Storyline Media, Elasticity Materials, Student's Motivation, Learning Achievement

I. INTRODUCTION

Education is a means and vehicle that plays an important role in producing competent human resources because it is in education that individuals are processed into human beings who have competitiveness. In Perpu No.20 of 2003 it is said that national education aims to develop the potential of students to become human beings who believe in and fear God Almighty, have noble, healthy, knowledgeable, capable, creative, independent, and become democratic citizens and citizens to be responsible. To achieve these educational goals, the government established educational institutions ranging from elementary to tertiary levels to bridge the community in learning. However, of the many schools established by the government, there is one educational institution that is more focused on skills, namely Vocational High Schools (SMK). Specifically, it can be explained the purpose of organizing the Vocational High School which is directed to prepare students to have an understanding of the skills of work with the quality of graduates to be able to meet the demands of the professional world of work and industry. However, in reality, the quality of vocational education is still not running optimally, so that it falls into the low category. The cause of SMK graduates who are unemployed is because these graduates are not fit for employment. One of the factors of the high unemployment rate of SMK graduates is that their competence is less accepted in the employment industry. Furthermore, the Open Unemployment Rate (TPT) of SMK graduates was 8.92% based on data from the Central Statistics Agency (BPS) as of 2018. It can be concluded that SMK graduates still did not meet the criteria desired by the industrial world. The quality of vocational education must be improved to be able to produce competent graduates and be able to be absorbed by the industrial world.

Based on the results of the preliminary study of researchers at Al-Amin Vocational School Surabaya in class X-MM and the results of the researchers interview with one of the physics teachers at the school, the following findings were obtained: teachers at the school

generally still use learning patterns that are teacher-centered, where the role the teacher still dominates the process of learning activities. One reason for this is the lack of teachers who carry out comprehensive learning planning activities. What is meant by comprehensive is developing and developing learning tools that are by the objectives and competencies of learning to be achieved. During this time the efforts made by the teacher are to apply the learning method through discussion and question and answer in class. Students are less actively involved in searching and finding information themselves. Practical activities are carried out if the conditions and time allow. Learning has the opportunity to create learning patterns that are monotonous and not by the characteristics of the material so that students tend to be bored, sleepy, and do other activities in the classroom. This certainly has an impact on the low learning achievement and the level of student understanding. Even the material elasticity that is quite essential in daily life also gets an average low learning outcome. The low learning achievement can be seen in the data shown by the physics teacher at Al-Amin Vocational School that the average daily test scores of students only reach 68.50. This means that many students get incomplete grades when doing daily tests. In addition to the data and the results of teacher interviews, researchers also conducted interviews with class X students. Based on the results of researcher's interviews with existing students, it was found that class X students majoring in multimedia in physics subjects complained a lot because they felt physics lessons were less supportive of vocational they took, namely multimedia majors. This shows the lack of student motivation to learn because students are more likely to like things based on multimedia.

The selection of learning models must be by the objectives of the curriculum, where learning in the 2013 curriculum at all levels uses a scientific approach. The scientific approach includes five learning experiences, namely observing, questioning, gathering information/experimenting, reasoning/associating, communicating. Inquiry involves students in activities and skills by focusing on the active search for knowledge and understanding [1]. Inquiry also can improve student's mastery of concepts and science process skills in learning activities. Guided inquiry is one of the levels in inquiry learning model that can be applied in the learning process at Vocational Schools because it matches the characteristics of students, where the intellectual development of middle-level students is still in the formal operational level which means that children can think logically and theoretically based on proportions. Another consideration for the use of guided inquiry is that the implementation of inquiry learning without guidance will confuse students so that guided inquiry can be one of the choices of learning models [2].

Several studies have been carried out regarding the implementation of inquiry in learning physics in schools. Students who through inquiry-based learning achieve higher scores than those through traditional methods [3]. Arslan applies open inquiry and guided inquiry to "pre-service" teachers and gets the results of some of the difficulties faced by teachers when implementing open inquiry. The difficulties that arise are (1) the absence of science process skills such as formulating hypotheses, research questions and defining variables (2) pre-service teachers for the first time meeting with inquiry-based laboratories (3) when researching concepts and associating practicum they are with the work of scientists, they don't know where and how to start research. If an open inquiry is difficult to practice, then guided inquiry can be used as a transition [4]. Bilgin revealed that guided inquiry learning used in cooperative learning can make students develop concepts and positive attitudes [5]. In addition to all of the above, it should also be noted that the world is currently entering the era of the industrial revolution 4.0. or the fourth world industrial revolution where technology has become the basis of human life. Everything has become limitless due to the development of the internet and digital technology. This era has influenced many aspects of life both in the economic, political, cultural, artistic, and even to the world of education.

The relationship between education and the industrial revolution 4.0. is the world of education is required to have to follow the development of technology that is growing rapidly and use it as more and all-advanced facilities to facilitate the learning process. Also, it is hoped that the use of information and communication technology in learning mindsets can shift from teacher-centered to student-centered. This is in line with the results of research which states that information and communication technology can improve the quality of education and as a support in the learning process. Technology must be as much a part of the classroom as other learning tools so that technology can act as a learning medium that helps teachers in learning activities. Learning media is a messenger technology that can be utilized for learning purposes. In addition to facilitating the teacher, instructional media also allows students to understand and comprehend something easier to remember it for a long time compared to the delivery of subject matter by way of lectures without assistive devices or learning media. There are so many media that can be used in learning, therefore any attempt to arrange the classification or classification according to the characteristics or characteristics is similar. Learning media, in general, are economized to be: (1) visual media, (2) audio media (listening media), (3) audio-visual media (hearing and listening media). This classification, which is suitable to be applied in learning activities for vocational students is audiovisual media. There are many advantages in the learning process that uses audiovisual media because the media can help students' understanding by seeing directly and can listen to explanations to be better understood by students. One of the audio visual-based learning media innovations that can be used is the Articulate Storyline.

Articulate Storyline is software that can be used to create interactive learning media with combined content of the text, images, graphics, sound, animation, and video [6]. The appearance of the work is similar to a powerpoint but is equipped with various optional features including characters, facial expressions, poses, and easy timeline settings, as well as music or video that can be edited directly on the timeline. This is supported by the results of previous research which states that the Articulate Storyline can have a significant impact on student learning outcomes and understanding of concepts [7]. The use of the Articulate Storyline media can increase student interest in learning so that an increase in learning achievement is obtained [8]. Based on these results, the use of the Articulate Storyline media in learning has a significant and effective impact in the learning process, so that students more easily understand the material being studied and can improve learning achievement. This is also quite supportive for Al-Amin Vocational School students who are indeed studying multimedia majors, where matters relating to information and communication technology will foster their learning motivation.

The provision of appropriate models and media are equally important in the implementation of the learning process. In the guided inquiry model seven phases must be carried out, namely presenting the problem, making a hypothesis, planning an investigation, carrying out an investigation, collecting data/information, making conclusions, and communicating. Media Articulate Storyline can be integrated into guided inquiry learning during the data collection phase and the communicating phase. Here Articulate Storyline can help students to

make presentations, where data collected from the results of experiments and analysis of these data will be presented as attractive as possible in the Articulate Storyline media. With the use of media such as this, it is hoped that student's learning motivation will increase to study physics and presentations can be more interactive because if students feel happy and interested in learning the student's knowledge will be firmly embedded in memory and can improve student understanding and results in student learning achievement. Based on the explanation above, the researcher wants to conduct research development of guided inquiry learning model by articulate storyline media on elasticity material to increase student's motivation and learning achievement.

II. EXPERIMENTAL METHOD

2.1 General Background of Research

This research type is development research, researchers develop instrument that produce certain products that include syllabus, lesson plans, student activity sheets (student worksheets), student books, and knowledge learning test results.

2.2 Sample of Research

The subject of this research is the instructional guided inquiry learning model by articulate storyline media while the test subjects are 60 students divided into 2 classes, namely X MM 1 and X MM 2 at SMK Al-Amin Surabaya in Academic Year 2019/2020.

2.2 Instrument and Procedures

This research development of guided inquiry learning model by articulate storyline media was carried out through two stages, namely the development phase of the learning instruments and the testing phase of the learning instrument. A research instrument is a tool used to measure natural and social phenomena observed [9]. The research instruments developed to collect data in this study are as follows: (a) Learning Instrument Validation Sheet, (b) Learning Observation Sheet, (c) Student Activity Observation Sheet, (d) Test Sheet, (e) Skill Assessment Sheet, and (f) Student Learning Motivation Questionnaire Sheet.

2.4 Data Analysis

The data analysis techniques of the development and testing guided inquiry learning model by articulate storyline media to improve student learning achievement are as follows:

a. Analysis of the Validity of Learning Instrument

The data analysis techniques of the validation of learning instrument which include syllabus, lesson plans, student books, worksheets, and knowledge tests use qualitative descriptive. The data is obtained by using a learning instrument validation sheet and based on validator assessment which is then calculated the average score given. The average value of the validator score is used to determine the quality of the learning instrument [11].

Table 2.1. Learning Instrument Validation Criteria

Interval Scores	Category Rating	Remarks
$3,60 \leq \text{score} \leq 4,00$	Very valid	Can be used without revision
$2,60 \leq \text{score} \leq 3,59$	Valid	Can be used with a little revision
$1,60 \leq \text{score} \leq 2,59$	Less valid	Can be used with many revisions
$1,00 \leq \text{score} \leq 1,59$	Invalid	Not yet usable and still requires consultation

The percentage of the suitability of the assessment of the two validators to the instructional development of guided inquiry learning model by articulate storyline media on elasticity material to increase student's motivation and learning achievement is based on interobserver agreement obtained from statistical analysis of the percentage of agreement [12]:

$$R = \left[1 - \left\{ \frac{A - B}{A + B} \right\} \right] \times 100\%$$

Information:

R = Percentage of agreement

A = Highest score from 2 evaluators

B = Lowest score from 2 evaluators

The instrument of appraisal is said to be reliable, if the reliability is $\geq 75\%$.

b. Practical Analysis of Learning Instrument

The practicality of the learning kit in terms of three aspects, namely the implementation of the learning kit, the activities of students during the learning process and the obstacles during the learning process.

1) Analysis of the Implementation of Lesson Plan

The data analysis technique of the implementation of learning uses descriptive qualitative. The score given by the two observers when observing the implementation of learning is in the range of 1 to 4 (1 = not good; 2 = not good; 3 = good; 4 = very good). The criteria for the outcome of learning are determined by calculating the average number of assessment scores given by two observers with the criteria as shown in Table 2.2

Table 2.2. Learning Implementation Criteria

Interval Scores	Category Rating
$3,60 \leq \text{score} \leq 4,00$	Very good
$2,60 \leq \text{score} \leq 3,59$	Good
$1,60 \leq \text{score} \leq 2,59$	Not good
$1,00 \leq \text{score} \leq 1,59$	Very bad

Like the analysis of the validity of learning instrument, the analysis of the implementation of the lesson plan also calculates the percentage matching test from two observers to the implementation of the lesson plan obtained from the statistical analysis of the percentage of agreement:

$$R = \left[1 - \left\{ \frac{A - B}{A + B} \right\} \right] \times 100\%$$

Information:

- R = Percentage of agreement
- A = Highest score from 2 evaluators
- B = Lowest score from 2 evaluators

2) Analysis of Student Activities

Analysis of student activities was carried out by two observers at each meeting. This assessment is carried out according to student activity observation sheets which are then analyzed in a quantitative description using the following percentage techniques:

$$P = \frac{\Sigma A}{\Sigma N} \times 100\%$$

Information:

- P = Percentage of student activity
- ΣA = Number of students carrying out the activity
- ΣN = Total number of students

3) Analysis of Obstacles During the Learning Process

Obstacle analysis is carried out by two observers during the learning process, written on the observation sheet of the learning process barriers for reflection on the learning process that has taken place and looking for a solution to improve the learning process at the next meeting.

c. Analysis of the effectiveness of learning instrument

The effectiveness of the learning instrument in terms of two aspects namely related to student motivation and student learning achievement after the learning process uses learning instrument that have been developed.

1) Analysis of Student Learning Motivation

Student learning motivation data obtained from student learning motivation questionnaires, then analyzed using qualitative descriptive. Analysis of student learning motivation questionnaire data using the Guttman scale. Students answer "Yes" is worth 1 and students answer "No" is worth 0. Mathematically can be written as follows:

$$P = \frac{\Sigma K}{\Sigma N} \times 100\%$$

Information:

- P: Percentage score of student learning motivation
- ΣK : Number of students who chose the answer Yes or No
- ΣN : Number of students who filled out the questionnaire

The percentage of student's learning motivation is converted with the following criteria [13]:

Table 2.3. Results of Student Learning Motivation Questionnaire Criteria

Interval Scores	Category Rating
76% - 100%	Very positive
51% - 75%	Positive
26% - 50%	Less Positive
0% - 25%	Not Positive

2) Analysis of learning achievement

Analysis of learning achievement is based on pretest and posttest learning outcomes data which are analyzed descriptively quantitative consisting of:

a) Complete learning indicators

Complete learning indicators can be calculated as a percentage using the following formula:

$$\text{Completeness of learner indicators} = \frac{\Sigma \text{students who attained IP}}{\Sigma \text{students}} \times 100\%$$

Information:

- IP = learning indicator
- The learning indicator is said to be achieved if the percentage of mastery learning $\geq 70\%$.

b) Individual completeness

This individual completeness is used for the assessment of knowledge competencies, skills competencies, and attitude competencies of each student. Students are said to be complete if the average value has reached the minimum completeness criteria (KKM). KKM on knowledge and skills competence that is equal to 2.66 with the title B-, while for KKM attitude is a good category. The following is the conversion of grades to fit the assessment model in the 2013 Curriculum.

c) Statistical Analysis

Statistical analysis was performed to determine an increase in student learning outcomes between before and after learning using learning tools that have been developed. Statistical analysis was performed using the average test of two samples with

paired t-tests. The stages of this statistical analysis are described as follows:

- Normality Test

A normality test is a test to find out whether the data owned is normally distributed so that it can be used in parametric statistics. The method that can be used to conduct a normality test is to use the chi-square formulation as follows [14]:

$$X^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

Information :

O_i = frequency of observation

E_i = expected / theoretical frequency

k = number of interval classes

A normality test is performed on each data sample that will be used (pretest and posttest). Samples can be said to be normally distributed if $X_{hitung}^2 > X_{(1-\alpha)(k-1)}^2$ with a level of trust ($\alpha = 0.05$).

- Paired sample t-test

A paired sample t-test is used to compare the average of two variables in a single sample group and is used to test the hypothesis that there is no difference between the two variables [15]. The formulation to determine the value of t is as follows:

$$t_{hitung} = \frac{\bar{D}}{\left(\frac{S_D}{\sqrt{n}}\right)}$$

Information:

$t_{arithmetic}$ = T value calculated

\bar{D} = average value of d ($x_1 - x_2$)

S_D : Standard deviation d

n: the amount of data

In this study, the paired sample t-test used is the average similarity test of one party (left-hand side).

- One-party test

One-party tests conducted to determine whether or not there is an increase in student learning achievement before learning is done with student learning outcomes after learning by using the left side test. The formulation of the hypothesis for this two-part test is:

$$H_0: \mu_1 \geq \mu_2 \quad H_1: \mu_1 < \mu_2$$

Information:

μ_1 = average pretest value

μ_2 = average posttest value

The initial hypothesis (H_0) says that there is no increase in student learning achievement before given learning (pretest) with significant student learning achievement after learning (posttest). The alternative hypothesis (H_1) says that there is an increase in student learning outcomes before given learning (pretest) with significant student learning outcomes after learning (posttest). Test criteria are: H_0 is accepted if $t_{count} >$ with a real level $\alpha = 0.05$. Data from the pre-test and post-test results were carried out by a qualitative descriptive analysis using N-Gain. N-Gain shows the magnitude of the increase in learning outcomes before and after treatment is given. According to Hake in Astuti (2014) Normalized score gain shows the level of effectiveness of the treatment on the acquisition of scores. N-Gain can be formulated as follows:

$$N_{Gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{maximum score} - \text{minimum score}}$$

Table 2.4. Interpretation of Normalized Gain

Normalized Gain Value	Interpretation
$-1.00 < g < 0.00$	There was a decrease
$g = 0.00$	There was no increase
$0.00 < g < 0.30$	Low
$0.30 \leq g < 0.70$	Medium
$0.70 \leq g \leq 1.00$	High

- Sensitivity Index

The sensitivity index of an item is a measure of how well the item can distinguish students who have received learning from students who have not received learning. An effective sensitivity index between 0.00-1.00 and closer to 1.00 indicates the sensitivity of items with greater learning effects. The item is said to be sensitive if the sensitivity of each item ≥ 0.30 (Astuti, 2014). The formula used to determine the sensitivity index is:

$$S = \frac{R_A - R_B}{T}$$

Information:

S = item sensitivity index

T = Number of students taking the test

R_A = number of students who answered correctly on the final test

R_B = number of students who answered correctly on the initial test

III. RESULT AND DISCUSSION

This research is a research development of guided inquiry learning model by articulate storyline media on elasticity material to increase student's motivation and learning achievement. Three criteria that need to be considered in assessing a product of research development are validity, practicality, and effectiveness. The learning instruments developed is a guided inquiry learning model by articulate storyline media. This learning instruments are used in vocational physics subjects on elasticity material. The process of designing this learning instruments is passed in two stages, the first is the feasibility test conducted by the validator and second, it makes improvements by the recommendations of the validator. The results of the validator assessment of the syllabus developed was valid with an average score of 3.46 and the percentage of matched assessment of the two validators was 98.29%. There are several aspects assessed in the development of this syllabus, including: syllabus identity, indicators, learning materials, learning activities, assessment, time allocation, and learning resources. The developed lesson plan is then validated by 2 validators. The aspects assessed by the validator include the formulation of learning objectives, learning activities, and language. The results of the RPP validation show that the RPP that was developed was valid with an average score of 3.43 and the percentage of matched assessment of the 2 validators was 94.49%. Based on the results of the assessment it is known that the lesson plans developed can be used in learning activities. The results of the validation of student books show that the developed student book has a valid category with an average score of 3.32 and the percentage of appraisal matches of the 2 validators is 95.6%. The worksheet developed by the researcher is said to have a valid category with an average score of 3.47 and the percentage of matched assessment of the two validators is 97.28%. Although valid in the category, the worksheet that was developed can only be used after it has been improved according to what is suggested by the validator. After repairs, the worksheets developed are suitable for use in learning activities. The results of this knowledge test gets a score above 2.6 so that the overall average score is 3.34 and the percentage of match matching of the 2 validators is 96.3%. Therefore, all items developed by researchers can be said to be valid and can be used in research. Nevertheless, some problems need to be improved according to the suggestions of the validator. Some suggestions given are adding the number of questions to the analyzing indicator, equating the terms in writing questions with those in student books, drawing spring using real spring rather than resistor form. After the improvement is made, the developed knowledge test is appropriate to be used to measure student learning outcomes before and after following the learning process by using tools that have been developed by researchers.

The practicality of the learning instruments developed was reviewed based on 3 conditions, namely the implementation of the learning plan, the activities of students during the learning process, and obstacles during the learning process. The implementation of learning is obtained from observations made by two observers according to the activity in the compiled lesson plan. The aspects observed as a whole consisted of initial activities, core activities, final activities, time allocation, and the atmosphere of teaching and learning activities. The RPP in this study uses the inquiry learning model. The application of inquiry learning models has learning phases integrated into the core activities of the learning process. Overall the value of observations made by observers during two meetings in class X-MM 1 was found that each aspect received an average score of ≥ 3.0 in the good category. In class X-MM 1 the average score obtained was 3.56 with a percentage of agreement of 96.39%. This means that in class X-MM 1 the learning implementation plan developed is already quite practical. While in class X-MM 2 the average score obtained was 3.49 with a percentage of agreement of 97.6%. This result also shows that the learning implementation plan developed at the second meeting was quite practical and positive student activities in both classes increased at the second meeting. In class X-MM 1 the most activity carried out was activity code G, which is making media, at meeting 1 this activity was carried out as much as 80% of the number of students, whereas at meeting 2 it increased to 93% of the number of students. This also applies when observations are made in class X-MM 2, where the activity that is mostly done is the activity of making media. At meeting 1 this activity was carried out as much as 75% of the total number of students, while at meeting 2 it increased to 90% of the number of students.

The effectiveness of learning can be known by observing student learning motivation questionnaire data and student learning achievement data. The first discussion is about the results of student learning motivation questionnaire data. Each statement experienced a percentage increase after learning with the guided inquiry learning model by articulate storyline media on elasticity material. In class X-MM 1 before getting treatment the results of the questionnaire got an average percentage of 12.67%, then after treatment received an average percentage of 89.33%. This means that an increase in learning motivation by 76.66%. In class X-MM 2 before getting treatment the results of the questionnaire got an average percentage of 14.33%, then after treatment received an average percentage of 81.90%. This means that an increase in learning motivation by 67.57%. Improved student learning achievement as seen from the pretest and posttest scores were analyzed using a two-party t-test and one-party t-test, which resulted in a tcount of 28.5527. While the table for the one-party test is 1.7613 and the table for the two-party test is 2.1447. This shows tcount > ttable which means that the application of guided inquiry learning model assisted by Articulate Storyline media can provide a significant difference between student pretest and posttest results. In addition to the results of the t-test, N-gain was also calculated to find out how much the increase in learning outcomes before learning (pretest) and after learning (posttest). Normalized score gain indicates the level of effectiveness of the treatment on the acquisition of scores. It can be seen that the value of N-Gain in the high category numbered 46 students from the total number of students of 60. While the N-Gain in the medium category numbered 13 students and the N-Gain in the low category numbered 1 person. The high number of N-Gain categories indicates that the learning process carried out has a significant impact on the mastery of student's knowledge before and after receiving learning using instructional learning instrument Articulate Storyline media. The results of the overall attitude assessment of students get the title "B" and "SB", for the percentage of the implementation of this attitude also > 70%, this provides information that the attitude competency in guided inquiry learning model by articulate storyline media has been completed for all students. From the

description above, it can be said that this learning instrument is effective enough to improve student learning outcomes in knowledge competencies, skills, and attitudes.

IV. CONCLUSION

Based on the research results of the development phase and the trial phase II that has been carried out on 60 students of X-MM class of SMK Al-Amin Surabaya it can be concluded that: (a) Guided inquiry learning model by articulate storyline media on elasticity material consisting of syllabus, lesson plans, student worksheets, student books, and knowledge test sheets have met the validity requirements of a learning instruments. (b) Guided inquiry learning model by articulate storyline media on elasticity material that has been developed otherwise practical. This is seen from the implementation of learning that gets an average of > 3.00 , positive student activity increases at the next meeting, and obstacles that occur during the learning process can find alternative solutions so that learning objectives are still achieved. (c) The instructional guided inquiry learning model by articulate storyline media on elasticity material is declared effective. This is observed from the increase in student learning achievement after learning using the developed learning instrument, in addition to that student motivation also increases. Based on the conclusions above, it can be concluded that in general the development of guided inquiry learning model by articulate storyline media on elasticity material to increase student's motivation and learning achievement.

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The Influence Of Parenting Style On Social Sensitivity And Student's Achievement In MTs. Tarbiyatul Ummah Robatal Sampang Madura

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Abstract- This research aims to influence of parenting style on social sensitivity and student's achievement in MTs. Tarbiyatul Ummah Robatal Sampang Madura. The research entitled the effect of parenting parents on social sensitivity in students in MTs. Tarbiyatul Ummah Robatal Sampang is a quantitative study. Quantitative research will use numbers as data which will be analyzed based on statistical tests. This research is a comparative causal study or ex post facto. Ex post facto research is used to find out the cause or relationship to events that have occurred. Ex post facto research aims to determine whether or not there is a relationship and how far the relationship exists between two or more variables. The purpose of an ex post facto investigation is to establish a relationship in making predictions. Through correlation, research will later find out whether there is an influence or relationship between variables with one another. Ex post facto research is a systematic empirical investigation in which scientists do not control the independent variables directly because the embodiment of these variables has occurred, or because the variables in the study cannot be manipulated. Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions. The population is not only people but objects and other natural objects, but the characteristics of properties possessed by research subjects. The population in this study were all parents of students in MTs. Tarbiyatul Ummah Robatal Sampang Madura academic year 2016-2017. Research Samples are part of the number and characteristics possessed by the population in other words the sample is representative of the population to be studied. The sample that will be taken by the researcher is the entire population is sampled by a probability sampling technique. Probability sampling is a sampling technique that provides an equal opportunity or accuracy for each element or member of the population to be selected as a sample. This research technique is used based on the total number of students who are only a few and do not reach 100 people. The conclusions that can be obtained in research at MTs Tarbiyatul Ummah Robatal Sampang Madura are: (1) The form of parenting for the majority of parents is authoritarian parenting, which means that most parents of MTs Tarbiyatul Ummah Robatal Sampang Madura take care of their children by giving physical punishment, giving rigid rules to children and limiting children's opportunities to express opinions so that children seem limited and afraid to develop. Also, children seem to think short and have a hard attitude. So there is a need for coaching for students' parents to be able to change their parenting practices to become the ideal parenting style, namely democratic parenting. (2) Parenting style will affect to student's social sensitivity, meaning that students with authoritarian parenting will have low social sensitivity due to pressure from the care so that students will be more aggressive, difficult to discipline and not sensitive to the sender, others and the environment. (3) Parenting patterns and student's social sensitivity will also influence student's achievement. This means that students who have low social sensitivity will not absorb class learning and are less disciplined in both learning activities and in the work done by the teacher so that student achievement is also low. This is evidenced by the average value of the results of UTS for students in MTS Tarbiyatul Ummah Robatal Sampang Madura. (4) Parenting style and student's social sensitivity simultaneously influence student's achievement, meaning parenting and social sensitivity is one of the factors that influence of improvement student's achievement.

Index Terms- Parenting Style, Social Sensitivity, Student's Achievement

I. INTRODUCTION

According to the book titled Seven Social Theories by Tom Campbell, it was revealed that humans are social creatures which mean humans cannot live without other people. Humans will not be able to live in isolation because humans need other people to be able to survive to form a society. Since humans are born, they need help from others. No human is born into the world without the help of others. Humans are social creatures, so between humans have a reciprocal relationship from one human to another human for example in terms of daily activities. When we want to cook our own it is not possible to grow rice and process it to become rice, make a pan with aluminum

which he formed himself, make salt by drying the seawater itself. Everything in our daily lives is the help of others, therefore every human being is required to have the nature of tolerance, social care, social sensitivity among others. Besides humans are social creatures, humans are also individual creatures who have boundaries with others. The individual attitude that is too high will bring a sense of selfishness which is the basis for the emergence of various problems that exist in Indonesian society. The many problems that arise in Indonesian social life are very diverse, for example in the sphere of government there is a culture of corruption which is part of the culture of state officials. Problems with the scope of schools are also still often found, for example, there are taruwan traditions between students, cheating cheats during exams, as well as violence committed by teachers to their students. stairs, etc. The various problems, if not solved, will affect social life and one of the solutions to overcome these problems is by increasing social sensitivity.

Social sensitivity can simply be interpreted as a person's ability to react quickly and accurately to certain social objects or situations that are around him. There are a variety of social sensitivities that are important to train in children from an early age, which in essence aims to erode the child's egocentrism and develop empathy for others around him. Among these social sensitivities is sharing with others, willing to help people in need. Another form of social sensitivity is the courage to apologize for making mistakes and to respect others who have different conditions. Social sensitivity can be trained in every individual human being by starting the easiest sensitivity, which is self-sensitivity. Self-sensitivity starts with simple things in daily life, for example, when we wake up we immediately clean the bed without being told by parents, go to school on time, do the tasks given at school and many things -Other things. If we can exercise sensitivity to our selves, we must exercise sensitivity for others and the environment around us, this is done because we are social beings who always need help from others in various ways. Various attempts have been made to increase social sensitivity in the young generation, especially in terms of education. Through curriculum changes made, the government is trying to increase social sensitivity through social studies subjects. The emergence of integrated social studies subjects at the junior secondary level is one of the government's efforts to improve existing education. The term social studies education is taken from social studies because learning patterns that take problems around students, so it is expected that with a new curriculum students understand and be aware of the social problems around them. which can be used as a solution to a problem that occurs.

In fact, at this time is the occurrence of moral degradation that struck Indonesian students and adolescents. As reported by Kompas.com, Bogor City Police Department arrested and detained two YKTB vocational students and one Yatek vocational student who was involved in the persecution and almost killed Hendro Pratama Putra, a PGRI vocational student. While according to the results of research from the Indonesian Child Protection Commission (KPAI), from January to September 2012, cases of student brawls in the Greater Jakarta area continued to increase. The number of brawl cases that occurred in Jabodetabek area was 103 cases. There were 48 lightly injured students, 39 seriously injured and 17 died. Whereas the level of brawl education consists of, 2 cases of elementary school, 19 cases of junior high school and 28 cases of high school/vocational school. These cases are mostly motivated by revenge instilled by their seniors who have been involved in brawls that occurred earlier. Seeing these conditions it can be concluded that the social sensitivity of Indonesian students is very alarming. The weak and uncritical ability to think can be easily influenced. This fact certainly goes against the main goal of social studies education to create good and moral citizens.

Efforts to increase social sensitivity can not be separated from aspects of an adequate curriculum, conditions in the community environment, facilities and infrastructures, as well as the large role of parents in daily life. Social sensitivity is not something that every child is born with. Social sensitivity arises and develops from and through experience and habituation. Experience and habituation of an individual is essentially the result of interaction between the individual and the environment. Because children are born to parents and grow up in a family environment, planting social sensitivity is the first and foremost task of parents. Parents are the first education agent before getting a formal education. It is the parents who will indirectly shape the thoughts of a person who will influence when the adult children later. Parents are expected to be able to apply parenting that can develop all aspects of early childhood development both cognitive, physical motor, language, arts, and morals as early as possible. The pattern means the arrangement, model, form, procedure, style of doing something. While caring means fostering interaction and communication attentively so that the child grows and develops into a mature person and can create a harmonious condition in the family and community environment. Based on these two understandings, parenting can be interpreted as a picture of the attitudes and behavior of parents and children in interacting, communicating during holding parenting activities [1].

Parenting has a very important role in the development of moral behavior in children because the basic moral behavior is first obtained by the child from home, namely from his parents. The process of development through education at school is just continuing the development that already exists. There are four types of parenting that are applied by each parent, the forms of parenting are, authoritarian parenting, democratic parenting, parenting neglect and permissive parenting [2]. Of the four types of parenting, the form of democratic parenting is best applied by parents in caring for their children. Four forms of parenting as follows: Authoritarian parenting is a type of parenting that demands that children obey and obey all commands and rules made by parents without any freedom to ask or express opinions own. Children are used as miniatures of life in achieving their life mission. Authoritarian parents try to run a household based on structure and tradition, although in many cases their pressure on order and supervision is a burden on children [3]. Democratic parenting is parenting marked by the recognition of children's abilities, children are allowed to not always depend on parents. Parents are friendly and children are free to express their opinions. Their parents are more willing to hear complaints from their children, willing to provide input. When the child is given a sentence, the parent explains why he should be punished. This parenting, in my opinion, is not much owned by parents today. Permissive parenting is this parenting characterized by the way parents educate children freely, children are considered as adults or adults who can think for themselves, he was given the widest possible leeway to do whatever was desired. Permissive parenting consists of two types, namely permissive indulgence, and permissive neglect. Permissive parenting indulges let children do whatever they want, without giving them control. So, in their teens, they never learn to control their behavior and always hope that their desires obeyed.

In addition to social sensitivity that can be influenced by parenting patterns that are applied at home, parenting patterns also influence the way students learn which will indirectly affect student achievement at school. A good way of learning will help improve student achievement that can be done by making a good division of time in learning and resting, choosing good ways of learning, choosing good learning facilities and encouragement from the family to improve student achievement. Unfortunately, many parents simply give up the responsibility of learning to their children without involving parents in the learning process. Generally, parents will only demand their children to get good achievements in school without having to participate in the learning process. Parenting parents know the child in the learning process. Authoritarian parenting will require their children to always get good achievements by telling them to always learn regardless of the condition of their children so that in an authoritarian parenting condition the child will feel burdened by the desires of parents who always demand him to get good grades. Democratic parenting will participate in the learning process of children. Parents will help the difficulties of children in learning and create a pleasant atmosphere, but parents still want their children to have good achievements but not impose their desires so that children will not be burdened during the learning process. Permissive parenting is a parent who is more likely to let the child during the learning process. Parents will allow children to learn according to their desires so that children will do learning by the wishes of their children. In parenting like this, children tend not to have good achievements because children do not have motivation in the learning process.

Achievements to be discussed in this study only focus on good daily test scores in one semester of students. Daily test scores will be a researcher's morning proposal about student achievement in school that is not only influenced by how students learn and motivation in learning but also the role of parenting parents in daily life that influences student achievement. Parenting that is applied to students in everyday life at home will form different personalities that will later influence the attitude of social sensitivity possessed by students both towards themselves, sensitivity to others and sensitivity to the environment and student achievement at school. There have been many studies that discuss parenting, but some have related to children's achievement, motivation to learn and academic abilities of children at school. The reality of a student is not only to have good academic skills but also to have a good social attitude. The tendency to have good academic skills is a sign balanced with good social abilities that will make children less able to read the social reality that is in the surrounding environment and be used as a basis when students mature later. Vice versa, if social skills are not matched by good academic abilities, it will result in students who are unable to provide solutions to the various realities that are around. Therefore, in this study, researchers will try to combine social skills and academic abilities.

The condition of social intelligence in MTs Tarbiyatul Ummah in Robatal sub-district of Sampang Regency because the background of mostly low parents educated at around 70% of all students has a direct impact on the process of educating children. Researchers conducted observations related to the daily behavior of students at random and found the fact that several male students smoked and committed acts of sexual abuse verbally and physically. In the researchers' thinking, this was done without the awareness of the perpetrators that it was wrong, the consideration was the gestures and expressions of the perpetrators when sexually harassing their female friends seemed spontaneous and did not show an element of intent. Also, researchers raise questions related to the plurality of Indonesian people, one of which is related to religion. Researchers ask that in Indonesia there are 6 religions recognized by the government namely Islam, Catholicism, Christianity, Hinduism, Buddhism, and Kong hu chu how the attitude of students if adherents of one of these religions live in the area of their residence. There was no specific answer stated, students gave an implicit answer, namely by telling an incident in another sub-district which was located nearby there had been a church that was burnt by the surrounding population, this, of course, is inseparable from the culture of the island of Madura famous for its Islamic and religious communities. Marked by the number of boarding schools and madrassas in each district.

An interesting fact is that in the observation of researchers the physical punishment system is still applied by teachers to students who violate school rules or take actions that are not appropriate for a student. The real example is the teacher hitting the body of the shoulder because the student is deliberately holding his girlfriend's buttocks. Another example is a teacher who tweaked the ears of students because of noise in the classroom and disturbing lessons. Seeing these two examples the researchers tried to compare with several similar cases that have occurred. As reported by online media okezone.com on August 10, 2016, a student and his parents in the city of Makassar came to school and then beat a teacher. The initial reason was that the teacher reprimanded a student who did not bring a picture book, but the student did not receive reprimanded by his teacher and turned to shout. This triggered the teacher's anger which then hit his shoulder. But the reaction that is raised by students does not reflect like a student, he exits the classroom and kicks the classroom door. In a few moments, the student's parents come to school and look for a teacher who hit his child. After meeting with the teacher the students and parents were looking for immediately hit him. In another case reported on jawapos.com on June 29, 2016, a teacher in Sidoarjo was reported to be the guardian of a student to the police because his child was pinched while at school. The reason for the teacher's pinching treatment is that the student does not want to carry out compulsory activities that become school programs. The two cases have a significant difference when compared to cases in MTs. Tarbiyatul Ummah is related to the reaction of students who are physically punished by the teacher. In Madura, the teacher has a high level of respect so that students have a sense of reticence and fear towards the teacher. It has been stated previously by researchers that there have been cases of harassment by students to students, that is, knowing the incident the teacher directly hits the abuser. No excessive response or resistance from the students concerned. Conversely, when returning from school the student who made the harassment came to the teacher's office and apologized for the correction he had done. This incident reflects how comparable the response received by the teacher when punishing his students in Madura and the two other areas that the researchers demonstrated.

Many books and writings in the mass media that write the greatest success of a child's responsibility is the parents. Parents depend entirely on children's education at school and it is the responsibility of the school to make children's education successful even though parenting to their children influences a child's attitude such as social sensitivity. Moreover, in the culture of some communities in Sampang Madura and Robatal sub-districts, especially living in boarding school, it seems to be a necessity for every child to get religious knowledge. The education and care process is left entirely to the boarding school. Based on the above background, the researcher wants about the influence of parenting style on social sensitivity and student's achievement in MTs. Tarbiyatul Ummah Robatal Sampang Madura.

II. EXPERIMENTAL METHOD

2.1 General Background of Research

The research entitled the effect of parenting parents on social sensitivity in students in MTs. Tarbiyatul Ummah Robatal Sampang is a quantitative study. Quantitative research will use numbers as data which will be analyzed based on statistical tests. This research is a comparative causal study or ex post facto. Ex post facto research is used to find out the cause or relationship to events that have occurred. Ex post facto research aims to determine whether or not there is a relationship and how far the relationship exists between two or more variables. The purpose of an ex post facto investigation is to establish a relationship in making predictions. Through correlation, research will later find out whether there is an influence or relationship between variables with one another. Ex post facto research is a systematic empirical investigation in which scientists do not control the independent variables directly because the embodiment of these variables has occurred, or because the variables in the study cannot be manipulated [4].

Ex post facto research is also used to prove ex post facto methods. hypotheses are like experimental research in general, but what distinguishes in ex post facto research does not use a treatment like experimental research. Beginning of the study, the study will conduct observations on the population so that researchers have an initial picture in the study. Researchers will use two kinds of questionnaires namely parenting questionnaires to determine the division of parenting parents in the research subject so that later will be used as a basis in data analysis. The second questionnaire was used to examine student's social sensitivity. The social sensitivity that the researcher wants to examine is related to self-sensitivity, sensitivity to others and sensitivity to the environment in daily life at school, demonstrated through the attitude of research samples at school.

After the researchers get data about social sensitivity and parenting based on a questionnaire that has been given to students, the researcher will look at the next variable, namely student achievement in school. Student's achievement in school used in this study results in daily test scores in the even semester which later researchers will do a test to find the relationship about the variables that researchers want to examine. Ex post facto research is not time-bound so researchers can conduct research at any time and in ex post facto research researchers will not give any treatment to the research sample.

2.2 Population and Sample of Research

a. Population

Population is a generalization area consisting of objects or subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions [5]. The population is not only people but objects and other natural objects, but the characteristics of properties possessed by research subjects. The population in this study were all parents of students in MTs. Tarbiyatul Ummah Robatal Sampang Madura academic year 2016-2017.

b. Sample

Research Samples are part of the number and characteristics possessed by the population in other words the sample is representative of the population to be studied. The sample that will be taken by the researcher is the entire population is sampled by a probability sampling technique. Probability sampling is a sampling technique that provides an equal opportunity or accuracy for each element or member of the population to be selected as a sample. This research technique is used based on the total number of students who are only a few and do not reach 100 people.

2.3 Technique and Instrument for Data Collection

a. Data Collection Technique

Data collection techniques used in this study are as follows:

- 1) Parenting style questionnaire test is a data collection technique by giving questions or questions that must be answered by respondents that contain parenting parents of research subjects.
- 2) The social sensitivity questionnaire test is a data collection technique by giving questions or questions that must be answered by respondents who contain the social sensitivity of research subjects.
- 3) Documentation of MTs student achievement report cards. Tarbiyatul Ummah during the even semester.

b. Data Collection Instrument

- 1) Parenting style questionnaire in the form of instruction statements that refer to indicators of parenting parents that have previously been compiled researchers and the results can be used to determine the classification of parenting parents. Parenting style questionnaires are made with environmental scale by classifying positive statements and negative statements that can be used to classify parenting parents. The parenting instrument contained closed questions, then respondents expressed attitudes that match the available choices. The preparation of the instrument is done by writing the instrument points that refer to the indicators of parenting. This questionnaire will give a short statement and students must provide a checklist (√) for the answers.

Table 2.1. Parenting Instrument Grid

No.	Statement	Type Of Parent		
		Authorities	Democratic	Permissive
1	Parental control	1, 4	2, 5	3, 6
2	Parental punishment	7, 10	8, 11	9, 12
3	Parental decision making with children	13, 16	14, 17	15, 18
4	Trends in children's attitudes	19, 31	20, 32	21, 33
5	Implementation of the wishes of parents	22, 37	23, 38	24, 39
6	Appreciation to children	25, 18	26, 29	27, 30

- 2) Social sensitivity questionnaire in the form of instructions statements that refer to indicators of social sensitivity that have been compiled by researchers and the results can be used to determine student's social sensitivity after learning. The social sensitivity questionnaire is made on an environmental scale by classifying positive statements and negative statements that can be used to measure the level of student's social sensitivity. The social sensitivity instrument contains closed questions, then respondents state attitudes that fit the available choices. The preparation of the instrument is done by writing the instrument points that refer to indicators of social sensitivity. This questionnaire will give a short statement and students must provide a checklist (√) for the answers.

Table 2.2. Social Sensitivity Grid

No.	Statement	Classification Statement	
		Positif	Negatif
1	Social sensitivity to self	11,22,	8,17,19,25,26,27,33,34,25
2	Social sensitivity towards others	5,7,10,12,16,23	4,6,13,15,18,21,24,28,29,30
3	Social sensitivity to the environment	1,3,31	2,9,14,20,32

- 3) Documentation of 7th grade student report cards in MTs. Tarbiyatul Ummah for one semester.

2.4 Data Analysis

Data analysis is a way to process research data to obtain a conclusion.

a. Prerequisite Test

Prerequisite tests are used to test normality and homogeneity tests.

1) Normality test

Normality Test is used to determine the data collected has a normal distribution or is taken from a normal population. Technical analysis of the normality test was carried out by a computer program SPSS release 16.00 for windows with one sample Kolmogrov-Smirnov sample with a signification level (α) 0.05. In this case, the hypothesis is tested as follows.

H_0 = Samples come from normally distributed populations

H_a = The sample does not come from a normally distributed population

The basis for deciding to find out whether the population variance is normal or not is as follows.

- If the significance or probability value > 0.05 , then the distribution is normal
- If the significance or probability value < 0.05 , then the distribution is normal

2) Homogeneity Test

The homogeneity test is used to provide confidence that the data obtained come from populations that are not much different in diversity or variation. testing the similarity of variance between two groups that are homogeneous or not SPSS 17.00. The testing criteria are used at a significance level of 5% in this case the hypothesis is tested as follows.

H_0 = Data derived from populations with the same diversity (same variance).

H_a = Data derived from populations that are not of the same diversity (different variances).

The basis of decision making to find out whether the population variance is homogeneous or not is as follows.

- If the significance or probability value > 0.05 , then the population is the same diversity.
- If the significance or probability value < 0.05 , then the population is not the same diversity.

b. Anova Test

Anova test or often called the analysis of variance is used to analyze variability or diversity of data into two sources of variation, namely variations in groups and variations between groups. There are some basic assumptions about the ANOVA test: the sample data used is normally distributed or considered normal, the population used has homogeneous variations, and the samples are not related to each other. The Anova test has two variants, namely the one-way Anova test and the two-way Anova test. Anova one-way test is used to test the comparative hypothesis of the average k sample, in which each sample consists of one category. Two-way ANOVA test is used to test the comparative hypothesis of the average k of the sample. The data in this study were analyzed with two-way ANOVA carried out with the test requirements namely distribution normality and variance homogeneity. Distribution normality was tested by Kologorv Smirnov. Homogeneity of variance is used to determine whether data is homogeneous or not. The importance of the homogeneity test is because it is used to determine whether each parenting has a homogeneous impact on social sensitivity and student learning achievement. If the requirements are not redundant then the data is analyzed by parametric which is used to test population parameters through statistics or to test population size through sample data. (the statistical sense here is data obtained from the sample) Two-way Anova with the F-test is used to test the mean differences across groups. For example, testing differences in parenting parents on social sensitivity and student's learning achievement. All calculations are performed with SPSS Version 16 for Windows.

c. Questionnaire Data Analysis

Social sensitivity questionnaire data were analyzed using a Likert scale with categories: never, rarely, often and very often. The score recap given by students to the statements in the social sensitivity and parenting questionnaire has the following conditions.

1) Statement of positive criteria

Score 1 = NEVER

Score 2 = RARELY

Score 3 = FREQUENTLY

Score 4 = VERY FREQUENTLY

- 2) Declaring negative criteria
Score 1 = VERY FREQUENTLY
Score 2 = FREQUENTLY
Score 3 = RARELY
Score 4 = NEVER

III. RESULT AND DISCUSSION

1. Forms of Parenting Style, Student's Social Sensitivity Conditions and Student Achievements

a. Form Parenting Style

Parenting style in this study there is three forms of parenting style namely authoritative, democratic and permissive. From the results of the research described in chapter IV, it can be seen that there are 4 students with democratic parenting (7.7%) meaning that only a few parents have understood student development to provide ideal or democratic parenting.

While there are 13 students with permissive parenting (25%), which means that there are several parents in MTs Tarbiyatul Ummah Robatal Sampang Madura who educate their children by giving a few rules, almost no punishment and because they believe in the abilities of children. And there are 35 students in the form of automated parenting (67.3%) meaning that most parents of MTs Tarbiyatul Ummah Robatal Sampang Madura take care of their children by giving physical punishment, giving rigid rules to children and limiting children's opportunities to express their opinions.

From the results of the above explanation, it can be concluded that parenting authoritarian type parents are still widely applied to parents of students at MTS Tarbiyatul Ummah Robatal Sampang Madura. So that it makes student development become affected especially in terms of student's social sensitivity. The importance of parenting processes that must be carried out by parents in printing children who are unable to compete and adapt to others and the environment.

Students with appropriate parenting that is democratic will be students who are responsible and disciplined in accepting all assignments given by the teacher. Students who are accustomed by their parents to express opinions, they will not be afraid of expressing their opinions in discussing and speaking in front of many people. Whereas students who are cared for by using authoritarian parenting will become angry, and timid students. The attitude of parents who always provide punishment will make students less confident and impressed quiet and difficult to manage. In other words, parental authoritarian parenting will cause students not to experience good growth and development.

b. The Condition of Student's Social Sensitivity

MTS Tarbiyatul Ummah Robatal Sampang Madura student's social sensitivity have condition with two students have a high level of social sensitivity (3.8%) which means that there are only two students who have high social sensitivity where this is a sensitivity to themselves, others and sensitivity to the environment.

While students with low social sensitivity conditions are 32 students (61.5%) meaning that most students of MTS Tarbiyatul Ummah Robatal Sampang Madura have low levels of social sensitivity. The student is not easy to receive messages or interact with others. This is reflected in the answers to the question items that explain that sensitivity to yourself, others and the environment is not balanced. Required understanding and guidance from parents and teachers so that students can develop their social environment. Students with a moderate social sensitivity category are 18 students (34.6%) which means some students have moderate social sensitivity. Able to understand the situation well and be able to interact with the surroundings.

The findings of this study indicate the tendency of most respondents to have a condition of low social sensitivity. This means that students with low social sensitivity conditions so students are less able to be sensitive to the conditions both directly and indirectly. Student's social sensitivity includes sensitivity to themselves, for example leaving school on time, doing assignments or carrying out a class picket. Sensitivity to others such as apologizing, respecting friends, teachers and other people as well as sensitivity to the environment such as throwing trash in his place.

c. Student's Achievement Conditions

Student's Achievement Conditions for students in MTs Tarbiyatul Ummah Robatal Sampang Madura there are 12 (23.1%) students who have high average grades. There were 17 (32.7%) students who had medium average scores and there were 23 (44.2%) students who had low average grades. From the findings of this research, it can be described that almost most students have a low average UAS score, so it can be said that students of the MTS Tarbiyatul Ummah Robatal Sampang Madura have low achievement. There is a need for coaching from teachers and parents so that students can improve their achievement.

2. Effect of Parenting Style Against Social Sensitivity and Student's Achievement

a. Description of Normality Test Results

Based on the Normality Test using Kolmogorov Smirnov analysis it can be seen that the data is normally distributed. This can be seen from the significance value ($p > 0.05$) which is 0.058 for parenting patterns and 0.065 on student's social sensitivity. So it can be said that the distribution of parenting data and student's social sensitivity for student's achievement is normal.

b. Description of Homogeneity Test Results

Based on the Homogeneity Test of parenting parents on students' social sensitivity it was found that the Homogeneity test results were known to be sig. Test of Homogeneity of Variance of $0.108 > 0.05$. Then it can be concluded that the variance of data resulting from student's social sensitivity by parenting is the same or homogeneous. Whereas based on testing the homogeneity of student's social sensitivity for student's achievement it was found that Homogeneity test results were known to be sig. Test of Homogeneity of Variance of $0.754 > 0.05$. It can be concluded that the variance of data resulting from students' social sensitivity to learning achievement is the same or homogeneous.

c. Description of Anova Test Results

Based on the ANOVA Test, parenting style on student's social sensitivity and student's achievement is the first hypothesis testing between parenting variables and student's achievement has a result of $0.008 < 0.050$ so that it is accepted and there is a relationship between variables and factors. In testing the second hypothesis between student's social sensitivity for student's achievement results from $0.165 > 0.050$ so it is rejected and there is no relationship between student's achievement variables and student's social sensitivity factors. In testing the third hypothesis between parenting patterns, and student's social sensitivity to student's achievement, the results obtained $0.008 < 0.050$, which means that there is a relationship between parenting patterns, student's social sensitivity and student's achievement in MTS tarbiyatul Ummah Robatal Sampang Madura.

IV. CONCLUSION

The conclusions that can be obtained in research at MTs Tarbiyatul Ummah Robatal Sampang Madura are: (1) The form of parenting for the majority of parents is authoritarian parenting, which means that most parents of MTs Tarbiyatul Ummah Robatal Sampang Madura take care of their children by giving physical punishment, giving rigid rules to children and limiting children's opportunities to express opinions so that children seem limited and afraid to develop. Also, children seem to think short and have a hard attitude. So there is a need for coaching for students' parents to be able to change their parenting practices to become the ideal parenting style, namely democratic parenting. (2) Parenting style will affect to student's social sensitivity, meaning that students with authoritarian parenting will have low social sensitivity due to pressure from the care so that students will be more aggressive, difficult to discipline and not sensitive to the sender, others and the environment. (3) Parenting patterns and student's social sensitivity will also influence student's achievement. This means that students who have low social sensitivity will not absorb class learning and are less disciplined in both learning activities and in the work done by the teacher so that student achievement is also low. This is evidenced by the average value of the results of UTS for students in MTS Tarbiyatul Ummah Robatal Sampang Madura. (4) Parenting style and student's social sensitivity simultaneously influence student's achievement, meaning parenting and social sensitivity is one of the factors that influence of improvement student's achievement.

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Digital Economy

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Abstract- Information and communication technologies have multiple functions. This means that both, technology and the economic system, are evolving. ICT and digitalization are affecting the economy as a separate sector of the economy. Investment and growth of this sector automatically contributes to the growth of economy.

Another form of influence is the effects of using, applying the technical achievements of these sectors in the economy, that is, influencing the productivity growth of other sectors. Use by the population has a positive impact on the growth of ICT as a sector. A third type of effect is to encourage new technologies to achieve sustainable development.

Rapid technological advances in production of ICT products and services can contribute to the growth of multifactorial productivity (MFP) in the ICT manufacturing sector.

Speed of innovation in the ICT sector itself has greatly reduced the cost of acquiring these technologies. This has made it possible to democratize the use of information and communication technologies, which applies even to the poor, who use these technologies, to improve their living conditions. ICTs also make's easier to implement programs to combat poverty.

In some countries, there has been an overall increase in the share of capital in economic development over the past decade. Information and communication technologies were the area of most investment. Also, studies on investing in information and communication technologies have emerged.

Index Terms- digital economy, tehnology,information, communication, internet.

I. INTRODUCTION

Digital economy is a general term used to describe markets that are based on digital technologies. Elements of the digital economy are: e-banking, electronic insurance, fast online search, training and distance learning, local and international information networks, electronic financial statements, information systems and software.¹ This new economy is a vital sector and an important engine of growth.

The OECD defines the concept of the digital economy as a whole range of economic, social and cultural activities, supported by the Internet and linked by information and communication technologies.

¹ Džamal David Salman, Ekonomija znanja, Aman, 2009.

² Džafar Hasan Džasim, Uvod u digitalnu ekonomiju, Aman, 2010.

³ Falih Hasan Halaf, Ekonomija znanja, Jordan, 2007.

II. TERM OF DIGITAL ECONOMY

Digital economy is intertwined with several similar terms, referring to equally contemporary phenomena. These are electronic economy, information economy and knowledge economy.

Electronic Economy (Digital, Web, Internet Economy) is an economic activity based on digital technologies that integrates with e-commerce and e-commerce and produces and sells electronic goods and services. Payments for e-economy services and goods are often made through electronic money.

The concept of electronic economy emerged in the last decade of the 20th century. In 1995, Nicholas Negroponte noticed and analyzed the growing lack of classic goods in "physical" form (weight, raw material, transport) and the benefits of the new economy (lack of weight of goods, speed and ease of transport (transport) worldwide, the absence of raw materials, etc.).

An information economy is an economy that, in different sectors, depends on information, an economy where the power of informatics is greater than the workforce in the agricultural, industrial and service sectors.²

The knowledge economy is an intensive use of knowledge in the pursuit of economic activities and their expansion, development and growth, characterized by the fact that capital knowledge is greater than the share of physical capital.³

Digital economy brings together several concepts and concepts:

- It is defined as the creation of new products, which are essentially knowledge shaped into a digital language (encryption and coding), which relies mainly on knowledge such as knowledge of computer processes.⁴
- A set of tools and tools that have changed from mechanical to electronic and digital and are managed through computers and Internet networks.
- It is defined as the pursuit of economic activities in the electronic field through the use of communication and information technology through the establishment of effective links between parties in an economic activity.⁵
- Digital economy involves the interaction, integration and coordination between information technology and

⁴ Halid Muhamed al Brahma, Digitalna investicija, Informaciona ekonomija, 2012.

⁵ Farid al Nadžar, Digitalna ekonomija, Egipat, 2007.

communication technology on the one hand and the national economy on the other.⁶

Digital economy is characterized by the work of building an information society by using information and communication technologies for economic development in many ways:⁷

- Information has become a force in modern societies in the age of digital evolution.
- The digital economy is based on developing the ability of people to use knowledge, information and products and to develop them as a key factor of productive economic value.
- Activate online economic activities and projects without the need for individuals and institutions.
- Availability of electronic contracts for conducting business transactions between individuals.
- The digital economy is linked to changes in the industrial environment.
- Digital globalization and the Internet have created an economy with limited access to consumers and market share everywhere in the world.

Informatics, computers and digital communication are the main drivers of the digital economy.

III. SCOPE OF THE DIGITAL ECONOMY

Digital economy is becoming an increasingly important part of the global economy.

Assessing the size of the digital economy is a major challenge and a topic of much controversy. Some authors divide the e-economy into "direct" (pure online business) and "indirect" (mixed digital and analog activities). The Boston Consulting Group estimated the size of the "Internet Economy" no matter what type of business it was. In 2016, it was \$ 2.3 trillion for the G20 group. The growth of the internet economy is extremely accelerating. It increased from 13.5% of GDP in 2013 to 23% of GDP in 2016.

According to World Investment Report (WIR, 2017), digital economy is affecting lives of an increasing number of people. Three-quarters of the population in the most developed economies use the internet, in developing countries the prevalence rate is about 50% and about 25% in Africa. There is also an increasing share of internet use in the economy of individuals. In developed and emerging countries, about two-thirds of residents buy online.

The share of the digital economy in business is booming. This applies to business-to-business transactions as well as business-to-consumer transactions. Internet sales (excluding closed digital networks between businesses), increased by a third between 2010 and 2015 according to the UNCTAD Digital Economy Report (UNCTAD, 2015). The value of business-to-consumer transactions has tripled from 0.5% of global GDP in 2010 to 1.5% in 2015. The internet industry itself accounts for about 4% of GDP in the largest economies.

Governments are increasingly using ICT to interact with citizens and provide services: According to the UN E-Government Development Index, 90 countries offer one or more portals for public information or online services, and 148 countries have at least one form of online transaction services.

IV. THE GOALS OF DIGITAL ECONOMY

Transition into digital economy can provide a strong technological boost to competitiveness in all sectors, as it brings great savings on all inputs. Transportation costs are particularly reduced.

Digital economy, with its many facets, provides new opportunities for business and entrepreneurial activity. It removes the geographical barriers⁸, that is, a new way of accessing foreign, especially very distant, markets. Digital economy provides new tools to solve significant development and social problems. Also, digital economy removes time barriers.

V. CREATING CONDITIONS FOR DIGITIZING ECONOMY

In general, digital economy depends on availability of satellites, international communications, personal accounts, subscriptions to the internet, designing corporate websites and using e-mail to prepare and send financial reports and information promptly. There are several conditions that developing countries must develop and improve, as a prerequisite for digitizing the economy.⁹

- Preparation of e-commerce program.
- Preparing a generation of young people to specialize in finance and e-investment through effective and cost-effective training.
- Development of financial institutions, banks, financial sections of companies and investment bodies to work on a digital basis.
- Supporting companies in the process of reengineering and switching to electronic financial systems.
- Connecting all financial departments and banks to Internet networks.
- Ensuring privacy of data and financial information for individuals and companies.

All these conditions have a common prerequisite, which is the construction of technological infrastructure.

VI. CREATION OF INFORMATION AND COMMUNICATION INFRASTRUCTURE

ICT infrastructure is mainly based on investment in the most widely used information and communication technologies, such as the software and automated media equipment industries.¹⁰ These innovative industries are based on the preparation, design, implementation, and selection of a computer program that includes a series of computer instructions. A feature of these

⁶ Basim Gadir, Ekonomija znanja, Sirija, 2010.

⁷ Fred Kolter, Ekonomija znanja, Alžir, 2009.

⁸ Rehi Mustafa Alijan, Informaciona ekonomija, Aman, 2010.

⁹ Hasan Muzafar al Rezu, Osnove digitalne ekonomije i uvod u internet ekonomiju, 2007.

¹⁰ Džamal David Salman, Ekonomija znanja, Aman, 2009.

industries is the reliance on the human mind, whose productivity is not limited by time or place, and is subject to an integrated marketing system with rapid and competitive returns in foreign markets.

Achieving well-developed infrastructure is important because it improves others such as health conditions and advancement in education.¹¹ In the information age, access to global ICT infrastructure, especially through communications, is one of the components of national competitiveness in the world. The infrastructure investments that underpin digital development are generally realized by telecommunications operators. These may be domestic or telecommunications multinational companies. These are large-scale and long-term investments, as they include international connectivity (submarine and land cables, mainly optical due to long distances), national connectivity (in-country and operator connectivity), metro (in-city operator interconnection).

According to the World Summit on the Information Society (WSIS), the most important principles for establishing a sustainable information technology infrastructure are:¹²

1. National development policy supporting investment in ICT infrastructure for new services.
2. A national e-strategy that establishes appropriate policies for universal access and means of delivery, including indicators for linking to ICT.
3. Developing and strengthening the structure of broadband networks at national, regional and international levels.
4. Support for technical, regulatory and operational studies conducted by the International Telecommunications Union and conducted by other relevant organizations.
5. Mitigate the challenges posed by illiteracy by using simple non-textual technologies to access people's information and communication technologies.¹³

Development of information and communication technologies has led to dramatic changes in lifestyles in various spheres - both at the individual or family level, as well as at the level of society, economy and the environment.

Since the end of the twentieth century, information and communication technologies have been considered a key driver of productivity growth. However, in the mass of articles, strategies, books and brochures, there is not much concrete quantitative research on the impact of ICT on the economy. Most of the major research is conducted by the OECD and refers to OECD countries, that is, developed countries. Most of these studies have demonstrated a positive and economically significant relationship between the state and dynamics of ICT and economic growth. Although the effects of the application of ICT on development are experientially evident, scientific research measuring the effects of

the use of ICT on economic growth is very rare. Even rarer are studies that analyze these effects in less developed and developing countries

An extensive 2003 OECD survey, entitled OECD, ICT and Economic Growth - Evidence from OECD Countries, Industries and Firms, found that investing in ICT has contributed to the growth and productivity of work in all OECD countries. Still, the impact is not even close in uniform. In the United States, this impact is far greater than in any other OECD country. Only in certain countries, more specifically the US and Australia, has the survey found that sectors that have invested heavily in ICT have experienced faster productivity growth. This is especially true of wholesale and retail trade.

There is little research on the impact of ICT investment on the economic growth and development of underdeveloped and developing countries, and the existing empirical evidence is relatively weak and contradictory, mainly as a result of the lack of reliable ICT data for these countries.

Information and communication technologies also provide a unique platform for a large number of sustainable development services, such as e-commerce, cashless payment systems, electronic education applications, e-health, territorial and climate change monitoring services, and more broadly e-government. Information and communication technologies can help to achieve solutions to the challenges of sustainable development in the world. Their rapid development enhances the key role of technology in all parts of society.

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Influence of nitrogen and phosphorus levels on growth and quality of Bermuda lawn grass (*Cynodon dactylon*) cv. Selection-1

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Abstract- A field trial was conducted during the period from October, 2013 to January, 2015 to study the effect of nitrogen and phosphorus on growth and quality of Bermuda lawn grass (*Cynodon dactylon*) cv. Selection-1 and to determine the most suitable dose for establishment and maintenance of a quality lawn. In the present investigation three levels of nitrogen viz., 10, 20 and 30 g/m², three levels of phosphorus viz., 5, 10 and 15 g/m² and a fixed dose of potassium viz., 5 g/m² were tried along with untreated control (viz., N₀P₀ and K₀) comprising of 10 different combinations. Nitrogen, phosphorus and potassium were applied as urea (46.0 % N), single super phosphate (16.0 % P₂O₅), and muriate of potash (60.0 %) respectively. The textural class of the soil of the experimental site was sandy loam with a pH of 5.82. The chemical analysis of the soil indicated that it contained 80 kg/ha available nitrogen 51 kg/ha available phosphorus, 517 kg/ha, exchangeable potassium and 1.34 % organic carbon. Stem cuttings of Bermuda turf were planted in the experimental plots with basal application of 20 g/m² vermicompost. Phosphorus was applied in a single dose along with 25 % each of N and K after three months of planting. Rest N and K were applied in three equal splits @ 25 % at three months interval. Observations were recorded on various growth and quality parameters. The result of the study revealed that significant differences existed among various treatments with respect to most of the parameters which recorded lowest values under untreated control viz., N₀, P₀ and K₀ and increased with increasing doses of fertilizer and the maximum values were recorded with the highest dose of fertilizer treatment viz., 30-15-5 g of NPK/m². Parameters like fresh weight of clipping, number of leaves per clipped shoot, verdure fresh weight and growth rate of shoots showed significant improvement under the highest dose of fertilizer viz., 30-15-5 g NPK/m² as compared to control viz., N₀P₀K₀ during all the observations and other lower dose of fertilizers during most of the observations recorded at different times. Although uniformity of lawn showed marginal improvement due to application of fertilizer over control as assessed by visual scoring, no significant difference was noticed among various treatments during any of the observations. So far as turf colour was concerned the best colour with maximum visual rating was noticed under the highest levels of N and P, yet it was at par with lower doses like 30-10-5, 30-5-5, 20-15-5 and 20-10-5 g NPK/m². Based on the result, it was concluded that a dose of 30-15-5 g of NPK/m² was the most suitable dose for establishment

and maintenance of a quality lawn developed from Bermuda lawn grass, cv. Selection-1.

Index Terms- Bermuda lawn grass, clipping, verdure, growth rate, uniformity, colour.

I. INTRODUCTION

Turfs provide beauty and attractiveness to the environment and are important in human activities from the functional, recreational and ornamental stand point (Beard, 1973). Ornamental turfs (lawn) serve a decorative function. Their uniform green appearance enhance the beauty of a landscape. To the landscape designers the lawn is considered as the green canvas on which the entire garden picture is built. Although lawn is vital part of a modern landscape garden, information available on various aspects of its management is very meagre under Indian condition and as such very little information is available on its nutritional management for development and maintenance of a quality lawn. *Cynodon dactylon* popularly known as Bermuda grass is one of the most widely used warm season turf grasses all over the world in lawns, parks, playground, aesthetic fields and golf courses, where dense turf is desired (Leto *et al.*, 2008). Hence, it was considered worth while to conduct a study on nutritional management of Bermuda turf grass cv. Selection 1 which is an important variety used in private and public gardens as well as in various landscape projects for making lawns under Indian condition.

II. MATERIALS AND METHODS

The present investigation was undertaken in the form of a field experiment in the Ornamental garden of College of Agriculture, Odisha University of Agriculture and Technology, Bhubaneswar during 2013-2015. Prior to conducting the experiment the soil of the experimental site was analyzed which was found to be sandy loam in texture with a pH of 5.82. Chemical analysis of the soil indicated that it contained 80 kg/ha available nitrogen, 51 kg/ha available phosphorus, 517 kg/ha exchangeable potassium and 1.34 % organic carbon. Bermuda grass (*Cynodon dactylon*), cv. Selection-1 was used in the present investigation. The experiment was conducted following Randomized Block

Design with four replications. Nitrogen at 10, 20 and 30 g/m² and phosphorus at 5, 10 and 15 g/m² were applied as treatments with a fixed dose of potassium (*viz.*, 5 g/m²) which were compared with an untreated control. In total there were 10 treatments combinations which were T₁ - N₀ P₀, K₀ (control), T₂ - N₁₀, P₅ K₅, T₃ - N₁₀ P₁₀ K₅, T₄ - N₁₀ P₁₅ K₅, T₅ - N₂₀ P₅ K₅, T₆ - N₂₀ P₁₀ K₅, T₇ - N₂₀ P₁₅ K₅, T₈ - N₃₀ P₅ K₅, T₉ - N₃₀ P₁₀ K₅, T₁₀ - N₃₀ P₁₅ K₅.

During land preparation, after final ploughing and prior to levelling, vermicompost @ 200 g/m² was thoroughly incorporated into the soil. Stem cuttings of cv. Selection-1 of Bermuda lawn grass were planted continuously in shallow groves drawn at a distance of 10 cm in the prepared plots on 30th October, 2013. Various doses of nitrogen and phosphorus along with fixed dose of potassium in different combinations as per the treatment schedule were applied in four splits. First application was done on 30th January, 2014 with full dose of phosphorus and 25 per cent each of nitrogen and potassium. The rest 75 per cent of nitrogen and potassium were applied in three equal splits @ 25 per cent each during 30th April, 30th July and 30th October, 2014. The fertilizers were applied each time after clipping of grasses in the experimental plots. The nutrients N, P and K were applied in the form of urea (46 % N), single super phosphate (16 % P₂O₅) and muriate of potash (60 % K₂O) respectively. On the other hand control plots *viz.*, N₀P₀K₀ received only vermicompost without application of any chemical fertilizers. Usual management practices like irrigation, weeding and plant protection measures were taken up at regular intervals. Grasses were mowed at a height of 5.0 cm from the ground level by means of a Falcon rotary lawn mower. The first mowing was done during the last week of January, 2014 after all the plots attained full coverage. Subsequent mowing was done at an interval of three months.

Observations on various growth and quality parameters such as fresh weight of clipping, number of leaves per clipped shoot, fresh weight of verdure, uniformity and colour were recorded four times during the experimental period at trimonthly interval the first one commencing from January, 2014. Growth rate of shoot was estimated thrice *i.e.*, between April - July, July - October, 2014 and October 2014-January, 2015.

For determination of fresh weight of clipping per unit area, grasses which were not mowed during previous three months were clipped by means of a grass cutting shear at a height of approximately 5.0 cm above the ground level from a sub sample area of 0.1 m² in each plot and collected in polythene bags and their weight was taken immediately to determine the fresh weight of clipping and expressed in grams. For determination of number of leaves per clipped shoot, 20 shoots were randomly selected from fresh clipping and the total leaf number presented in individual shoot was counted and the mean of 20 readings was calculated and used for analysis. For estimation of fresh weight of verdure the entire quantity of plant materials from 0.1 m² subsample area in each plot were clipped close to the ground surface (mass of grass remaining below the clipping height) immediately after mowing the turf. The verdure was calculated from the same subsample area used for collection and determination of clipping fresh weight and its weight was recorded immediately after collection and expressed in grams. Growth rate of shoot was estimated by measuring the shoot length increment between the two consecutive cuts and was expressed in percentage. Uniformity, an estimate of even appearance of turf (an

area free from patches, blemishes and irregular growth habit) and turf colour were evaluated each time after 24 hours of mowing visually by five persons based on 1 to 5 scale (poorest to best). The value of assessment was presented by the mean value of five observations.

III. RESULTS AND DISCUSSION

Fresh weight of clipping

Fresh weight of clipping is one of the important parameters related to better growth of turf. Significant difference was noticed in fresh weight of clipping due to application of various levels of nitrogen and phosphorus with a fixed dose of potassium (Table 1). It was significantly lower under untreated control (N₀P₀K₀) which increased with increasing dose of fertilizers and the maximum weight was observed with application of highest dose of fertilizers *viz.*, 30-15-5 g NPK/m² (T₁₀) which differed significantly from control as well as other doses of fertilizer. During April and October the minimum clipping fresh weight of 8.96g and 11.93 g per 0.1 m² area were recorded under control respectively while the maximum fresh weight of 20.34 g and 24.50 g per 0.1 m² were recorded under T₁₀ *i.e.*, 30-15-5 g NPK/m² during the corresponding observation period. Higher fertilizer rates ensured ample supply of nutrients which encouraged vigorous growth resulting in higher fresh weight of clipping. The result of the present study is in conformity with earlier workers like Soldat *et al.* (2008), Pease *et al.* (2011) and Mc Mahon and Hunter (2012) who also recorded higher clipping yield in different turf grasses with higher nitrogen rates. On the other hand phosphorus is a constituent of many energy rich compounds in plants and also involved in active root growth and helps in uptake of other nutrients (Marshner, 1986).

IV. NUMBER OF LEAVES PER CLIPPED SHOOT

Various levels of nitrogen and phosphorus had significant influence on number of leaves per clipped shoot of Bermuda grass during different times (Table 1). The leaf number was minimum under control which showed an increasing trend with increase in N and P rates and maximum number was recorded under T₁₀ receiving the highest dose (30-15-5 g NPK/m²) of fertilizer. However, during April average leaf number under T₁₀ and T₉ (30-15-5 g NPK/m²) were statistically comparable with each other which recorded 9.96 and 9.83 leaves per clipped shoot respectively. Similarly during October T₁₀, T₉ and T₈ (30-5-5 g NPK/m²) did not show any significant variation in leaf number which had 14.54, 13.81 and 13.61 leaves per clipped shoot respectively. On the other hand the untreated control (N₀P₀K₀/m²) recorded 8.04 and 11.59 leaves per clipped shoot during April and October respectively. It was observed that nitrogen at its highest rate *i.e.*, 30 g/m² was the most effective dose along with 15, 10 or 5 g phosphorus which could improve the leaf number.

It has been reported that higher doses of nitrogen increased shoot growth (Trenholm *et al.*, 2001, Beard, 1973). Further Prine and Burton (1956) reported that increasing N fertilization increased stem length and internode number. These may be the contributing factors for increasing leaf number per clipped shoot as observed in the present investigation.

V. FRESH WEIGHT OF VERDURE

Fresh weight of verdure was also significantly influenced by various levels of N and P along with fixed dose of K. (Table 2) Verdure is an important parameter related to turf quality. Higher weight of verdure ensures a dense and compact turf which gives more comfort to the visitors. It was observed that fresh weight of verdure was significantly lower under control which increased with increasing rates of N and P fertilization and maximum fresh weight was recorded under T₁₀ (30-15-5 g NPK/m²). However, during April and October it was closely followed by and at par with T₉ (30-10-5 g NPK/m²). During April a verdure fresh weight of 6.42 g per 0.1 m² was recorded under control while it was 8.42 g and 8.37 g per 0.1 m² under T₁₀ and T₉ respectively. During October the verdure fresh weight under control was 7.06 g per 0.1 m² whereas the same under T₁₀ and T₉ were 10.25 g and 10.19 g per 0.1 m² respectively.

The finding of the present study with respect to nitrogen is in accordance with observations of Trenholm *et al.* (2001) who also reported higher weight of verdure in two ecotypes of Seashore Paspalum with increased rate of N from 192 kg to 392 kg/ha. Alderman *et al.* (2011) also reported that N fertilization increased stem mass in Tifton 85 Bermuda grass as compared to control and lower rates. Increase in fresh weight of verdure due to application of higher doses of N and P may be attributed to the fact that adequate nitrogen is necessary to maintain high shoot density which contributes towards verdure while phosphorus is extremely important for rooting, cell division and synthesis of compounds used by plants for better growth (Beard, 1973).

VI. GROWTH RATE OF SHOOTS

Growth rate of shoots which was calculated on the basis of percentage increase in shoot length between two consecutive cuts was significantly influenced by various levels of N and P fertilization (Table 2). It was significantly lower under control (i.e., N₀P₀K₀) which increased with increasing dose of fertilizer and the maximum growth rate was observed under T₁₀ receiving the highest dose of fertilizer treatment (30-15-5 g NPK/m²). Growth rate of shoots between April and July under control was 94.00 per cent while it was 201 per cent under T₁₀ during the same observation period. During the period between October and January the growth rate under control was 219.00 per cent. On the other hand it was 289.00 per cent under T₁₀ closely followed by and at par with T₉ (30-5-5 g NPK/m²) which recorded growth rate of 288.00 and 286.00 per cent respectively. It was observed that T₁₀, T₉ and T₈ which received highest dose of nitrogen i.e., 30 g/m² exhibited better performance as compared to lower nitrogen rates. Similar findings have also been reported by Alderman *et al.* (2011) who concluded that increasing N fertilization increased growth rate of Tifton 85 Bermuda grass. Positive influence of nitrogen on growth rate of Bermuda grass shoot may be attributed to the fact that nitrogen is a component of nucleic acid, amino acid, protein, chlorophyll and coenzymes affecting rate of shoot development while phosphorus improved root growth ultimately affecting the shoot growth since shoot growth is dependent on root growth (Beard, 1973).

VII. UNIFORMITY

Uniformity of turf indicated by free from uneven growth, blemishes and maintenance of dense uniform grass was usually assessed by scoring technique in 1 (poorest) to 5 (best) point scale as influenced by various levels of fertilizer treatments.

As indicated in Table 3 uniformity with lowest scoring was produced under control which showed a marginal improvement with increasing dose of fertilizer treatment and the most uniform turf was produced under T₁₀ which received the highest dose of fertilizer i.e. 30-15-5 g NPK/m². The uniformity in control plots had least visual scoring of 3.81 and 4.13 during April and October respectively while the uniformity under T₁₀ which was observed to be most satisfactory had visual scoring of 4.50 and 4.81 respectively during the same observation period. However, application of fertilizer could not bring any significant improvement in uniformity as evident from the result of the present investigation.

It appeared that uniformity of the turf is mostly influenced by the growth pattern of specific grass species/variety which is an inherent character of that particular grass species/variety and is less affected by fertilizer application as observed in the present study on Bermuda grass cv. Selection-1. However, higher uniformity with increased visual quality of Seashore Paspalum turf grass was observed by Treholm *et al.* (2001) due to application of higher nitrogen rates.

VIII. COLOUR

Lawn/turf with attractive green colour is always preferred in any garden, park or play ground which counts much towards its aesthetic value. The data in Table 3 revealed that significant difference existed among various levels of fertilizer treatment with respect to assessment of colour of Bermuda lawn grass. It was observed that minimum scoring for colour was obtained by the turf under control and the rating was increased with increasing rates of fertilizer application. During April most inferior colour was noticed under control with a scoring of 4.14 and it was at par with T₂ (10-5-5 g NPK/m²) and T₃ (10-10-5 g NPK/m²) with visual scoring of 4.33 and 4.45 respectively. On the other hand the best colour was noticed under T₁₀ (30-15-5 g NPK/m²) which had a visual scoring of 4.95. Besides other treatments like T₉ (30-10-5 g NPK/m²), T₈ (30-5-5 g NPK/m²) and T₇ (20-15-5 g NPK/m²) also had better performance with respect to colour with similar scoring of 4.95. Further turf colour under T₆ (20-10-5 g NPK/m²) was also statistically comparable with these treatments which had a visual scoring of 4.83.

During October, turf with most inferior colour was also noticed under control with a scoring of 3.63. However, it was at par with T₂, T₃ and T₄ which had visual scoring of 4.00, 4.00 and 4.06 respectively. On the other hand best colour with a visual scoring of 4.63 was noticed under T₁₀. However, it was followed by and at par with T₉, T₈, T₇, T₆ and T₅ which had visual scoring of 4.38, 4.38, 4.19, 4.19 and 4.13, respectively.

It is a well known fact that nitrogen is a component of chlorophyll. It promotes rapid growth, encourages a dense lawn and produces a dark green turf (Beard, 1973). In the present study

only higher rates of nitrogen i.e., 30 or 20 g/m² irrespective of phosphorus doses could improve the colour of Bermuda turf. The visual scoring for colour under untreated control and treatments receiving lower nitrogen rate i.e., 10 g/m² were more or less similar and less attractive without showing significant variation. The result of the present study is in conformity with the findings of Trenholm *et al.* (2001) who also observed that higher nitrogen rate (392 kg/ha) increased the visual quality and colour of Seashore Paspalum turf grass as compared to lower nitrogen rate of 196 kg per hectare.

Based on the study it was concluded that Bermuda lawn grass cv. Selection-1 responded well to various doses of nitrogen and phosphorus along with a dose of 5 g potassium per sq. metre which exhibited better performance in terms of growth and quality parameters. Various parameters were appreciably improved with increased dose of nitrogen and phosphorus and the best performance was observed with the highest dose of nitrogen and phosphorus i.e., 30 g N and 15 g P with 5.0 g K per sq. metre.

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Table 1 Interaction effect of nitrogen and phosphorus on fresh weight of clipping and number of leaves per clipped shoot of Bermuda lawn grass cv. Selection-I during April and October, 2014

Treatment (NPK g/m ²)	Fresh weight of clipping (g/0.1 m ²)		Number of leaves per clipped shoot	
	April	October	April	October
T ₁ (N ₀ P ₀ K ₀) (Control)	8.96	11.93	8.04	11.59
T ₂ (N ₁₀ P ₅ K ₅)	11.02	15.60	8.30	11.88
T ₃ (N ₁₀ P ₁₀ K ₅)	13.64	16.38	8.61	12.13
T ₄ (N ₁₀ P ₁₅ K ₅)	14.40	20.33	8.65	12.79
T ₅ (N ₂₀ P ₅ K ₅)	15.49	20.40	9.20	12.89
T ₆ (N ₂₀ P ₁₀ K ₅)	16.96	20.73	9.30	13.09
T ₇ (N ₂₀ P ₁₅ K ₅)	17.23	23.69	9.35	13.21
T ₈ (N ₃₀ P ₅ K ₅)	17.80	23.93	9.49	13.61
T ₉ (N ₃₀ P ₁₀ K ₅)	17.85	24.20	9.83	13.81
T ₁₀ (N ₃₀ P ₁₅ K ₅)	20.34	24.50	9.96	14.54
SEm (±)	0.03	0.06	0.08	0.40
CD at 5%	0.07	0.17	0.23	1.16

Table 2 Interaction effect of nitrogen and phosphorus on fresh weight of verdure and growth rate of shoots of Bermuda lawn grass cv. Selection-I

Treatment (NPK g/m ²)	Fresh weight of verdure (g/0.1 m ²)		Growth rate of shoots (%)	
	April 2014	October 2014	April-July, 2014	October 2014 - January, 2015
T ₁ (N ₀ P ₀ K ₀) (Control)	6.42	7.06	94.00	219.00
T ₂ (N ₁₀ P ₅ K ₅)	7.10	7.34	105.00	228.00
T ₃ (N ₁₀ P ₁₀ K ₅)	7.10	7.86	114.00	228.00
T ₄ (N ₁₀ P ₁₅ K ₅)	7.64	8.71	118.00	260.00
T ₅ (N ₂₀ P ₅ K ₅)	7.69	8.74	122.00	267.00
T ₆ (N ₂₀ P ₁₀ K ₅)	7.90	8.85	130.50	277.00
T ₇ (N ₂₀ P ₁₅ K ₅)	7.95	9.06	133.00	285.00
T ₈ (N ₃₀ P ₅ K ₅)	7.99	9.47	142.00	286.00
T ₉ (N ₃₀ P ₁₀ K ₅)	8.37	10.19	151.00	288.00
T ₁₀ (N ₃₀ P ₁₅ K ₅)	8.42	10.25	201.00	289.00
SEm (±)	0.03	0.02	1.27	1.19
CD at 5%	0.08	0.07	3.71	3.44

Table 3 Interaction effect of nitrogen and phosphorus on visual scoring in 1(poorest) -5(best) point scale for uniformity and colour of Bermuda lawn grass cv. Selection-I during April and October, 2014

Treatment (NPK g/m ²)	Uniformity		Colour	
	April	October	April	October
T ₁ (N ₀ P ₀ K ₀) (Control)	3.81	4.13	4.14	3.63
T ₂ (N ₁₀ P ₅ K ₅)	4.00	4.19	4.33	4.00
T ₃ (N ₁₀ P ₁₀ K ₅)	4.06	4.25	4.45	4.00
T ₄ (N ₁₀ P ₁₅ K ₅)	4.13	4.25	4.51	4.06
T ₅ (N ₂₀ P ₅ K ₅)	4.13	4.31	4.60	4.13
T ₆ (N ₂₀ P ₁₀ K ₅)	4.19	4.31	4.83	4.19
T ₇ (N ₂₀ P ₁₅ K ₅)	4.25	4.38	4.95	4.19
T ₈ (N ₃₀ P ₅ K ₅)	4.38	4.38	4.95	4.38
T ₉ (N ₃₀ P ₁₀ K ₅)	4.50	4.44	4.95	4.38
T ₁₀ (N ₃₀ P ₁₅ K ₅)	4.50	4.81	4.95	4.63
SEm (±)	0.197	0.192	0.106	0.179
CD at 5%	NS	NS	0.31	0.52

Effect of Nickel Sulphate Toxicity On Radish Plant

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Abstract- To check and analyze the effect of nickel sulphate toxicity on radish plant, a research was conducted in the old Botanical Garden at University of Agriculture, Faisalabad. In different concentrations of nickel sulphate solution (10, 20, 30 mM), *Raphanussativus* specie of radish (Mooli Day-40) was grown to study the morphological parameters like shoot and root length, shoot nad root weight, number of leaves, total carotenoids and chlorophyll. Ni-stress remarkably reduced the growth attributes of radish plant. Results were reported after data collection and applying statistical anaylsis by using latest software packages. A noticeable drop in physiological and morphological attributes was recorded. However in biochemical attributes level of chlorophyll a and b was reduced while subsequent elevation was noticed in carotenoid concentration.

Index Terms- Chlorophyll a and b, Carotenoid, Nickel sulphate, Toxicity

I. INTRODUCTION

Radish (*Raphanus sativus* L.) is a root vegetable of genus *Raphanus* and family Cruciferae or Brassicaceae which was domesticated in Central West of India and China (Thamburaj and Singh, 2005). Consumption of these edible vegetables help in preventing of several diseases hence called as protective food. Vegetables are cheapest, richest and natural source of protective food providing vitamins, fats, proteins, minerals and carbohydrates. According to recommended diet plan, vegetable consumption should be 300 g/day per person. Out of 300 g, 125 g leafy green vegetables, 100 g of deep rooted vegetables and 75 g of others should be included (Salaria, 2009).

During radish metabolism myrosinase enzyme leads to enzymatic hydrolysis of glucosinolates forming isothiocyanates (Kim *et al.*, 2015). Some plant cells also affected with cancer due to proliferation of abnormal cells(Naem *et al.*, 2019). In fact, bacterial microflora, present in human colon, also exhibit same enzymatic activity. Several health properties and molecular features of radish has also been described in many research studies. For example, a biologically active compound named as methylisogermabullone (C₂₃H₃₁O₅NS, MW 433) is extracted from radish help in activation of acetyl cholinergic receptors that ultimately leads to small bowel motility (Jeong *et al.*, 2005). 4-(Methylthio)-3-butenyl isothiocyanate induce apoptosinin to reduce the risk of human colon cancer (Barillari *et al.*, 2008) .

A recent study found that sulfuraphene which is an isothiocyanate of radish stop the proliferation of human breast

cancer cells (Pawlik *et al.*, 2017). Basically, yield and growth of this vegetable depend on soil and prevailing weather conditions. Plant DNA barcodes are used for species identification (Naem *et al.*, 2019). Different plants also suffer from cadmium toxicity(Shafiq *et al.*, 2019). Different radish varieties have different requirements of climate and soil for optimum yield and growth but one of the most important agro techniques is nutrition. Raddish crop requirements varies with agro-climatic conditions, soil fertility, humidity and soil type. Plants based products used in pharmaceutical industries (Usman *et al.*, 2019). Being a fast growing crop and due to its short duration its root growth should be uninterrupted and rapid. For good quality and optimum production of radish, fertilization through inorganic, organic and biofertilizers are very essential components (Dhanajaya, 2007).

Plants identified on the basis of special DNA barcodes (Ahmad *et al.*, 2019). Radish is eaten in both raw form (as salad) and in cooked form so it is grown for its young tender tubercle root. It is delighted in its pervasive flavour that's why considered as appetizer. Young leaves also eaten in both fresh and cooked forms. Due to its depurative and refreshing properties, it is quite useful in treating gall blader and liver stones. Plants based products used in pharmaceutical industries (Usman *et al.*, 2019). Other medicinal uses include treatment of sleeplessness, neuralgic headache and chronic diarrhea. Leaves, roots, pod and flower are very effectual against gram positive bacteria. Moreover, roots are also effective in piles, urinary complaints and in gastrodynia. White ash is prepared from processing of roots which act as remedy for constipation and diuresis.

Plants leaves contain special pores called stomata (Naem *et al.*, 2019). Uptake of different heavy metals by plants alter growth mechnisms by activating secondary responses like oxidative damage (Choudhury and Panda, 2004), may be by the accumulation of H₂O₂ which is occur by shifting the balance of reactive oxygen species metabolism (Mithofer *et al.*, 2004). Metals interaction with growth and metabolism has reciprocal effect which ultimately disturbs plant growth. Plants based neutraceuticals products used in pharmaceutical industries (Usman *et al.*, 2019). For instance the quantity of one metal may effect positively or negatively to other element, either it modify or lessens the toxic effects of heavy metals (Mukherjee and Mishra, 2008). Epidermis of plants detected using microscopic examination (Raza *et al.*, 2019). Copper-nickel interactions and zinc-nickel interactions are ineffective in reducing effect of nickel, in other words, different concentrations of copper and zinc neither increased nor reduced the nickel toxicity.

Now a days, due to excessive industrial use nickel toxicity became a special concern. Under stressful conditions various detoxification responses of nickel like Ni²⁺ – NA Complexes and Ni²⁺-organic acid appear in plants (Kupper *et al.*, 2001), the overproduction of NA and it's synthase (Weber *et al.*, 2004), and high levels of free histidine (Wycisk *et al.*, 2004). However other responses include induction of thiol glutathione and MTs (Bellion *et al.*, 2007) and High concentrations of glutathione, Cys and O-acetyl-L-serine (OOAS (Freeman *et al.*, 2004).

Besides this some enzymatic activities are regulated such as glutathione reductase and serine acetyltransferase. During Ni-stress conditions the toxicity symptoms also develop in plants but responses are differ substantially according to growth stage, plant species, cultivation conditions, exposure time and Ni concentration (Assuncao *et al.*, 2003). Some plants contain enzymes for fight against oxidative stress (Naem *et al.*, 2019). In sensitive species level of critical toxicity is 10 mg/kg dry weight (DW) (Kozlow, 2005), in moderately tolerant species is 50 mg/kg DW and in hyper accumulator plants like *Thlaspi* and *Alyssum* species is 1000 mg/kg DW (Pollard *et al.*, 2002). Plants based hybrid system studied in plant genetics (Ahsan *et al.*, 2019) In other sensitive species of plants such as water spinach, barley and wheat the necrosis and chlorosis of leaves appear when plants are treated with low level of nickel (0.2 mM or 11.74 ppm) for about a week (Rahman *et al.*, 2005).

Nickel toxicity in radish plants is demonstrated by chlorosis, growth inhibition, wilting and necrosis. Those plants which grow in contaminated soils normally have elevated level of heavy metals depending on total concentration of soil and genotype of plants (Alexander *et al.*, 2006).

Pandey and Gopal (2010) investigated the effect of Ni concentration on different metabolic and growth activities of plants affecting eggplant developmental processes. First, seeds of eggplant (cv. Hybrid P.K.123) were sown in very refined sand in range from 0.1 to 400 µM. Then expose them to Ni > 50 µM leads to decrease the level of photosynthetic pigments, activities of peroxidase and catalase, biomass and level of iron in stem and leaves so the low level of chlorophyll and enzymatic activities of peroxidase, Heme and catalase with increase Ni concentration may indicate interference in iron metabolism in plants. With the increasing level of Ni the ribonuclease and superoxide dismutase activities and proline level also increased. In leaves of plants oxidative damage is observed as the level of lipid peroxidation. After 10 days treatment with 400 µM Ni clearly visible symptoms of chlorosis necrosis and Ni toxicity are appeared at margins and veins. Observed toxicity of metals has major symptom of membrane damage due to production of ROS particularly at higher (30–400 µM) levels of Ni.

II. MATERIALS AND METHODS

Nickel effects on radish seeds was checked by conducting pot experiments. During the second week of germination nickel was applied to seedlings in different concentrations such as 0, 10, 20 and 30 mM. For this purpose foliar application was used by which stress was applied in solution form.

Sowing and culture medium:

Radish seeds of genotype Mooli Day-40 were obtained from Ayyub Agriculture Research Institute (AARI) Faisalabad and then directly sown in plastic pot. An underneath hole covered by fine piece of cotton cloth was present in all pots. Every pot was filled up with 2.5 kg sand and then washed it very well. After germination of radish plants, seedlings were thinned to keep 5 plants of equal size in each pot. Then, plant was treated with nickel to conduct my experiment.

Treatments and Source:

Simple water taken from watering plants of University of Agriculture, Faisalabad. Nickel sulphate was taken from Botany Department in proper concentrations and then made solution by adding 1L of water then give to specific plants. Normal water or 0 mM Nickel solution, 10 mM Nickel solution, 20 mM Nickel solution, 4–30 mM Nickel solution.

Harvests:

After treatment of 45 days plants were harvested and the following parameters were checked.

Shoot and Root length (cm)

The length of root and shoot was checked by meter rod and average values also calculated.

Shoot and Root fresh weight (g)

Uproot the plants by using top loading balance and immediately determined the fresh weight of root and shoot and finally calculate the mean values.

Shoot and Root dry weight (g)

For calculating the constant dry weight keep the fresh samples for 1 week in oven at 65°C and average dry weight was determined.

Statistical Analysis:

Statistical analysis on calculated data was performed, apply CO-state, draw ANOVA tables and finally data was filled in tables.

III. RESULT AND DISCUSSION

The analysis of variance of data collected for shoot length of genotype Mooli Day-40 that was grown under both nickel sulphate and control is presented in (Table 4.1, Fig 4.1). It is observed that nickel sulphate leads to significant reduction ($P \geq 0.001$) in shoot length. At 30 mM of nickel sulphate concentration in foliar medium maximum reduction in shoot length is visualized while in control condition there is maximum increase (Fig 4.1).

For root length of genotype (Mooli Day-40) that was grown in both control and nickel sulphate conditions the analysis of variance of collected data is given in (Table 4.2, Fig 4.2). By applying Ni-stress significant reduction ($P \geq 0.01$) in root length is observed. There is maximum increase in control conditions and maximum decrease at 30 mM concentration of Nickel sulphate in foliar medium (Fig 4.2).

Table.4.1: Analysis of Variance of data for shoot length of redish(Moli Day-40) under Nickel sulphate effect

SOV	Df	SS	MS	F	P
Treatment	3	80.726	26.909	20.689	.0004***
Error	8	10.405	1.300		

***, **, * = significant at 0.001, 0.01 and 0.05 probability levels respectively, ns= non-significant

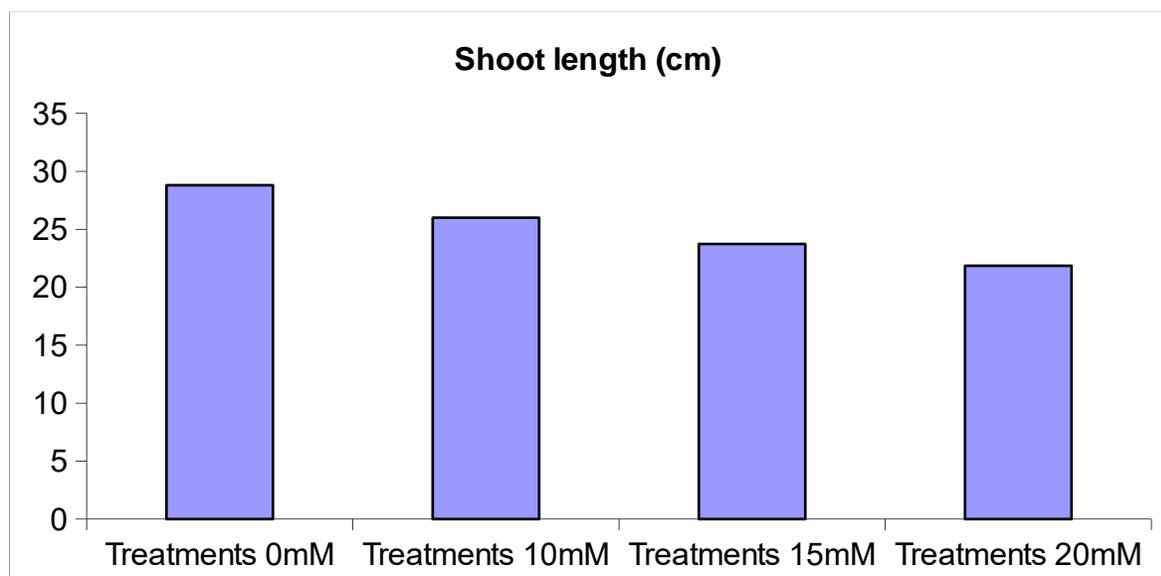


Fig 4.1: Influence of exogenously applied Nickel sulphate on shoot length of radish genotype grown under control and Nickel sulphate effect conditions.

Fig 4.2: Analysis of Variance of data for root length of radish (Moli Day-40) under Nickel sulphate effect

SOV	Df	SS	MS	F	P
Treatment	3	11.0572	3.685	12.627	.0021**
Error	8	2.335	0.291		

***, **, * = significant at 0.001, 0.01 and 0.05 probability levels respectively, ns= non- significant

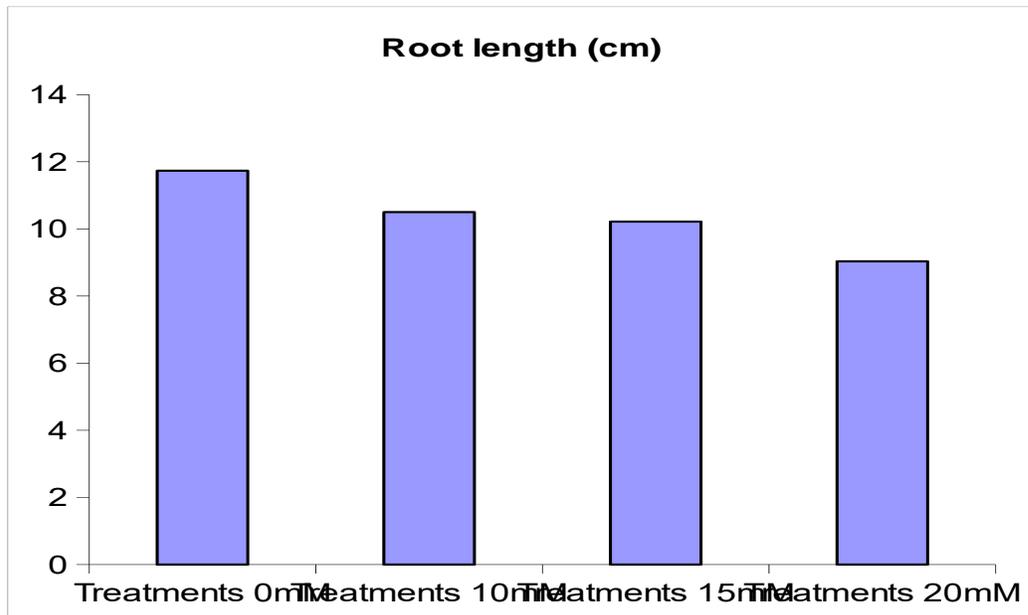


Fig 4.2: Influence of exogenously applied Nickel sulphate on Root length of radish genotype grown under control and Nickel sulphate effect condition.

IV. CONCLUSION

A soil culture research was conducted in University of Agriculture Faisalabad, in the wire house of old Botanical Garden, by applying Foliar medium on radish (*Raphanus sativus*) of genotype Mooli Day-40 to compute the effect of nickel sulphate on physiological, photosynthetic, growth and biochemical parameters. For this purpose four different levels of Ni-sulphate (0, 10, 20 and 30 mM) were used and the order of applications used in experiment was 0 mM Nickel sulphate +1liter H₂O, 10mM Nickle sulphate +1liter H₂O, 20 mM Nickel sulphate+1liter H₂O and 30 mM Nickel sulphate+1liter H₂O. Such coresponding applications of Nickel sulphate were applied respectively. During this planned research it was observed that imposition of Ni-sulphate stress leads to considerabale reduction in growth patterns such as dry and fresh weights of shoots and roots, plant height, carotenoids and cholorophyl-a,b contents and number of leaves per plant. Imposition of Ni-sulphate via Foliar medium result in tremendous increase in carotenoid accumulation in plants. Significance and non- significance in various attributes of genotype Mooli Day-40 has also be calculated by statistical analysis and shown in ANOVA table.

In conclusion, all above features of radish plant give best results by applying control and show less results by giving 30 mMNickel sulphate concentration.

CONFLICT OF INTEREST:

There is no conflict of interest towards this research. All authors have contributed a significant role for publication of this research in writing of this research article.

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Verifying Tourism-Led Growth Hypothesis (TLGH) in Ethiopia: Time series analysis

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Abstract- Tourism-led growth hypothesis argues that international tourism is a source of economic advancement through generating foreign currency, creating employment opportunities, stimulating greater investments in infrastructure and inspiring the development of other economic sectors that ultimately improved the living standard of the citizens of a country. Knowing the importance of tourism sector, Ethiopia has taken this sector as a strategy to achieve its short and long run economic objectives. Therefore, the principal objective of this study is to validate the Tourism-Led growth hypothesis (TLGH) in Ethiopia over the annual period 1991-2018. To attain the envisaged objective, the standard Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests were applied to check the stationarity of each series. To scrutinize the long run relationship between tourism and economic growth, ARDL bound test of cointegration was applied. In addition, pairwise Granger causality test was used to identify the direction of causality between tourism receipt and economic growth. The empirical findings confirm the existence of long run relationship between tourism receipt, economic growth and other control variables. The results of the pairwise Granger causality also predicted unidirectional causality running from tourism receipt to economic growth in long run. This validates the tourism-led growth hypothesis for Ethiopia. Hence, policy makers should focus on promoting and development of the untapped tourism industry of the country to augment economic growth in Ethiopia.

Index Terms- Tourism, economic growth, cointegration, pairwise causality

I. INTRODUCTION

Tourism-led growth hypothesis (TLGH) assumes that the development of international tourism boosts economic growth. Similar to the export-led growth hypothesis (ELGH), it advocates that economic advancement can be promoted not only by increasing human resources and technology within the economy, but also by intensifying foreign exchange earnings (Ohlan, 2017). Consequently, different scholars have tried to analyze the effect of tourism on growth and development process of a given economy. Ekanayake and Long (2012) argued that tourism is vital for economic advancement, employment generation and thereby poverty reduction. In addition to providing direct employment creation in the hotel and restaurant industries, it also creates employment in other sectors through its externality on other sector such as agriculture, manufacturing, and food processing and also service sectors such as banking, foreign

exchange transactions, transportation, communication (Kammas and Salehi-Esfahani, 1992). It can also improve the current account balance through generating foreign currency (Oh, 2005). International tourism directly inspires the development of local industries such as transport, hotels and restaurants, manufacturing, handicraft, agriculture and the trade (Lionetti and Gonzalez, 2012). Besides, Khalil, Kakar, and Malik (2007) argued that tourism industry can boost household's income and government revenues through multiplier effects.

However, many authors questioned the favorable effect of international tourism on economic growth as there might be leakages as well. According to Kammas and Salehi-Esfahani (1992), "imported goods that are demanded by the tourists, and the cost of goods and services that are needed for the infrastructural development of the industry" are the leakages. In addition, the expansion of the tourism infrastructure such as construction of hotels could cause the pollution of coastal waters, especially if sewerage capacity is inadequate (Sunlu, 2003). As a result, tourism expansion may adversely affect the economy. Therefore, it is important to conduct more vigorous research so as to evaluate the net effect of tourism industry on a given economy.

Even though the empirical findings have no clear-cut answer for the effect of tourism on economic growth, many countries give attention international tourism as a strategy to achieve their short and long run economic objectives. Ethiopia is one of the countries that used it as its development strategy. In Ethiopia, the perception about the importance of tourism industry is traced back to the early 1960s. Ethiopia has been working to revitalize the nation's tourism industry through restructuring the responsible organizations and introducing new systems (Ministry of Culture and Tourism, 2019). According to the United Nations World Tourism Organization report and Ministry of tourism and culture reports, the number of international tourists and tourism receipts in Ethiopia is gradually increasing from time to time. Therefore, the main objective of the study is to analyze the effect of tourism on economic growth in Ethiopia over the period 1991-2018. That means, this paper tests the validity of tourism-led growth hypothesis for Ethiopia.

The remaining part of the paper is organized as follows: Section-two briefly reviews theoretical and empirical literature. Section-three deals with research methodology and model specification. Section-four consists of the result and discussion part of the paper. The last section deals with brief conclusion and recommendation.

II. LITERATURE REVIEW

2.1. Theoretical literature

According to the Tourism-led growth hypothesis (TLGH), international tourism is a source of economic growth for many countries through its contribution to foreign exchange revenues for government and stimulating greater investments in infrastructure that ultimately improve the living standard of the citizens of a country (Balaguer & Cantavella-J, 2002 ; UNWTo, 2017 and Risso & Bonapace, 2009). There are four major mechanisms through which tourism industry can positively affect economic growth. First, like export, tourism generates foreign currency required to finance imports of investment and intermediate goods used to add value in the production process. Second, tourism industry inspires investments in physical infrastructure and in human capital like education (Brida , Cortes-Jimenez and Pulina ,2016). Third, the spending of international tourism can inspire the development of other industries such as transport, hotels and restaurants, manufacturing, handicraft, agriculture and the trade (Lee, 2012 and Lionetti and Gonzalez, 2012 and Brida, Cortes-Jimenez and Pulina ,2016). Fourth, it can directly or indirectly generate employment that activate consumption and investment among local economic agents (Kammas and Salehi-Esfahani, 1992, Ekanayake and Long, 2012 and Brida, Cortes-Jimenez and Pulina ,2016).

1.2. Empirical Literature

Numerous empirical studies have been steered on the association between international tourism and economic growth. But their empirical findings are mixed. For instance, Balaguer and Cantavella-Jorda (2002) studied the effect of tourism on economic growth in Spain by using quarterly time series data from 1975-1997. They employed Johansen cointegration and Granger causality test to validate the connection between tourism and economic growth. Their findings showed that there is a long run relationship between tourism and economic growth and the causality runs from tourism to economic growth. Similarly, Grillon (2013) analyzed the dynamics between international tourism and economic growth in Dominican economy during the period 1991-2012. He employed ARDL bounds test to cointegration proposes by Pesaran et al. (2001) and the results confirmed the existence of a long-run equilibrium relationship between tourist arrivals and overall economic growth. Besides, the granger pairwise causality tests show causality running from tourist arrivals to aggregate output expansion. Moreover, Ohlan, (2017) studied the link between tourism and economic growth in India by over the period of 1960-2014. To investigate the relationship between the two variables he used the newly-developed Bayer and Hanck combined cointegration test and the result indicated that tourism and economic growth are cointegrated. In addition, the Granger-causation test indicated the tourism leads economic growth. Shih and Do (2016) also found a favorable impact of tourism on economic growth over the period of 1995-2013 by using a Granger causality test and Rolling Window regression method. The findings revealed that tourism has played a key role in driving economic growth in Vietnam economy.

On the other hand, Ekanayake & Long (2012) applied heterogeneous panel cointegration technique to examine the effect of tourism sector on economic growth in developing countries. But their finding showed that the elasticity of tourism revenue with respect to economic growth is positive but not statistically significant in developing countries fails to support. Their granger causality test also fails to support tourism-led growth hypothesis. This finding is supported by Chou (2013). He found a neutral relationship between tourism development and economic growth for Bulgaria, Romania and Slovenia. Similarly, Oh (2005) said that there is no long-run association between tourism and economic growth in South Korea, and he found a uni-directional causality running from economic growth to tourism development. Another research done by Payne and Mervan, (2010) in Croatia by applying Toda-Yamamoto long-run causality test over the period 2000-2008 did not confirm the existence of tourism-led growth hypothesis. Their empirical finding reveals a positive unidirectional causality that runs from real GDP to international tourism receipt which support for the economic-driven tourism growth hypothesis rather than tourism driven economic growth hypothesis. Chou (2013) also found a significant and negative impact of tourism spending on economic growth in Estonia and Hungary. According to Chou, the detrimental effect of tourism on economic growth is resulted in due to an increase in the relative price of non-traded goods which lowers the demand for the capital used in the traded sector.

III. METHODOLOGY OF THE STUDY

3.1. Data Source and variable description

This study used 28-year annual data from 1991-2018E.C. The dependent variable is per capita real GDP which is used as a proxy for economic growth while the explanatory variables are tourism receipt to export ratio, real gross capital formation, and gross enrollment. The variables nominated in the study are based on the tourism-led growth hypothesis which posits that international tourism boosts economic growth through intensifying foreign exchange earnings, creating employment opportunity and positive externality (Ohlan,2017). The inclusion of other control variables (gross capital formation-proxy for physical capital formation and gross enrollment rate -proxy for human capital) in the analysis is to reduces the omitted variable bias. In addition, as the dependence of Ethiopian Economy on Agriculture is very high, drought dummy which captures the recurrent drought is included in the model. The dynamics of leadership change may have an economic implication on a given country (Carbone & Pellegata, 2018). Therefor to capture the effect of leadership change on economic growth, leadership change dummy is added to in to the model. International tourism receipt is measured as a ratio of total export while government spending and remittance are measured as a percentage of GDP. Some of the variables included in the model were obtained from international official data sources (world development indicator and UN-stats) while the remaining variables were obtained from domestic sources (from ministry of culture and tourism and ministry of education).

3.2. The Model

In order to verify the tourism-led growth hypothesis, the standard classical production function is used. Because it is the most widely used aggregate production function in macroeconomics analysis. For instances, Balaguer and Cantavella-Jordà (2002) have followed this functional form in order to prove the link between tourism and economic growth. In addition to the standard production inputs (human and physical capital) tourism was included in the model as non-standard type of export. Therefore, my research followed the following modified production function:

$$PCGDP_{gt} = \beta_0 + \beta_1 TOUR_t + \beta_2 RGFC_{gt} + \beta_3 ENROL_{gt} + \beta_4 DROUT_t + \beta_5 LEDCH + U_t$$

Where: PCGDP_{gt} = Per capita real GDP growth rate at time *t*.
TOUR_t = Tourism receipt as a percentage of total export
RGFC_{gt} = Real gross fixed capital growth rate.
ENROL_{gt} = Growth rate of secondary school gross enrolment.
DROUT = Dummy variable for recurrent drought
LEDCH = Dummy variable for leadership change
e_t = Random variable at time *t*.
U_t = error term

3.3. Method of Analysis

3.3.1. Stationarity test

Most time series data exhibit a non-stationary pattern in their levels. So, in order to determine the degree of stationarity, a unit root testing was carried out through the Augmented Dicky-Fuller (ADF) test and Philips-Perron (PP) test.

3.3.2. Cointegration test

In order to test the existence of a stationary equilibrium relationship among the variables of interest, the univariate cointegration approaches of Engle and Granger (1987) and Phillips and Hansen (1990), and the multivariate cointegration procedures of Johansen and Juselius (1990), have been used extensively in the literature. Recently, the cointegration approach by Pesaran et al. (2001), known as the ARDL bounds testing, has become popular among researchers. In this research, ARDL approach to cointegration is used to prove the existence of long run and short-run relationship among the variables of interest. This approach has several advantages over other cointegration techniques (Pesaran et al., 2001). First, it is applicable irrespective of whether the underlying regressors are purely I (0), purely I (1) or fractionally integrated. Second, the model uses a sufficient number of lags to capture the data-generating process in general to the specific modelling framework. Third, the error correction model is derivable from the ARDL through a simple linear combination, which integrates both short-run adjustments with long-run information without losing the latter's information. Fourth, the small samples properties of the ARDL procedure are far superior to those of the multivariate cointegration techniques. Fifth, endogeneity and serial correlation problems are corrected through appropriate lag selection. (Umoh and Effiong, 2013). Therefore, this study applied Autoregressive Distributed Lag (ARDL) Model to analyzing the long run and short run effects of tourism receipt on economic growth in Ethiopia. To test whether

there is a long run equilibrium relationship between the variables; bounds test for co-integration is carried out as proposed by Pesaran, Shin, and Smith (2001). Accordingly, the hypothesis of the relationship between tourism receipt and economic growth is tested based on the following ARDL bound test equation.

$$\Delta PCGDP_{gt} = \beta_0 + \lambda_1 PCGDP_{g,t-1} + \lambda_2 LnTOUR_{t-1} + \lambda_3 RGFC_{g,t-1} + \lambda_4 ENROL_{g,t-1} + \beta_1 \sum_{i=1}^n \Delta PCGDP_{g,t-i} + \beta_2 \sum_{i=0}^n \Delta TOUR_{t-i} + \beta_3 \sum_{i=0}^n \Delta LnRGFC_{g,t-i} + \beta_4 \sum_{i=0}^n \Delta ENROL_{g,t-i} + \beta_5 DROUT_t + \beta_6 DROUT_t + e_t$$

Where: PCGDP_{gt} = Per capita real GDP growth rate at time *t*.
TOUR_t = Tourism receipt as a percentage of total export
RGFC_{gt} = Real gross fixed capital growth rate at time *t*.
ENRO_{gt} = Growth rate of secondary school gross enrolment
DROUT = Dummy variable for recurrent drought
LEDCH = Dummy variable for leadership change
e_t = Random variable at time *t*.

According to Pesaran et al. (2001), if the computed Wald F-statistic is less than the lower bound critical value, there is no long run relationship between the variables included in the model (tourism receipt and economic growth and other control variables). That means, the null hypothesis ($\lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0$.) will not be rejected. On the other hand, if the calculated F-statistic is greater than the upper bound critical value, then there is a long run relationship between tourism receipt and economic growth accepted. That means, alternative hypothesis of long run relationship ($\lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq 0$.) will be accepted.

Further, pairwise Granger causality test is applied to determine whether there is uni-directional causality or bi-directional causality between tourism receipt and economic growth in Ethiopia.

IV. OVERVIEW OF TOURISM SECTOR IN ETHIOPIA

In Ethiopia, the perception about the importance of tourism industry is traced back to the early 1960s. Ethiopia has been working to revitalize the nation's tourism industry through restructuring the responsible organizations and introducing new systems (Ministry of Culture and Tourism, 2019). As clearly indicated in Figure-1, the number of international tourists has gradually increased over the past twenty-seven years. In 1991 the number of international tourists in Ethiopia was about 81581. This figure has continuously increased up to the year 1997 and reached 138856. In the next two consecutive it has recorded a poor performance. This could be due to the war between Ethiopia and Eritrea which took place from 1998 to 2000. After the year 2000, the total no of tourists arrived in Ethiopia has continued to grow until 2017. In comparison to the growth registered in previous years, the increment in tourism number in 2016 was insignificant. This slowdown in visitor arrivals in 2016 was due to the violent anti-government protests across the country started at the end of 2015 which led the Ethiopian government to pronounce a six-month state of emergency. Countries which are the major source of Ethiopian tourism market (United States, United Kingdom, Germany and others) cautioned their citizens not to travel to some regions of Ethiopia. This phenomenon adversely affected

Ethiopia’s holiday tourism sector as many international operators cancelled planned trips (Altes,2018). Then the figure of visitor arrivals has reimbursed to progress in 2017. However, the number of visitors again declined in 2018.

Similar to the trend of visitor arrival, the gross revenue generated by the tourism sector (tourism receipt) has recorded a continuous progress (except for the year 1998 and 1999) over the

past twenty-seven years. However, the progress in tourism receipt showed a big jump since 2013. This structural break was happened due to the update of parameters used to calculate tourism revenue (Tourism Statistics bulletin, 2009-2015). This shows that tourism sector could be one potential sector of foreign currency generation (see Figure-2 for detail).

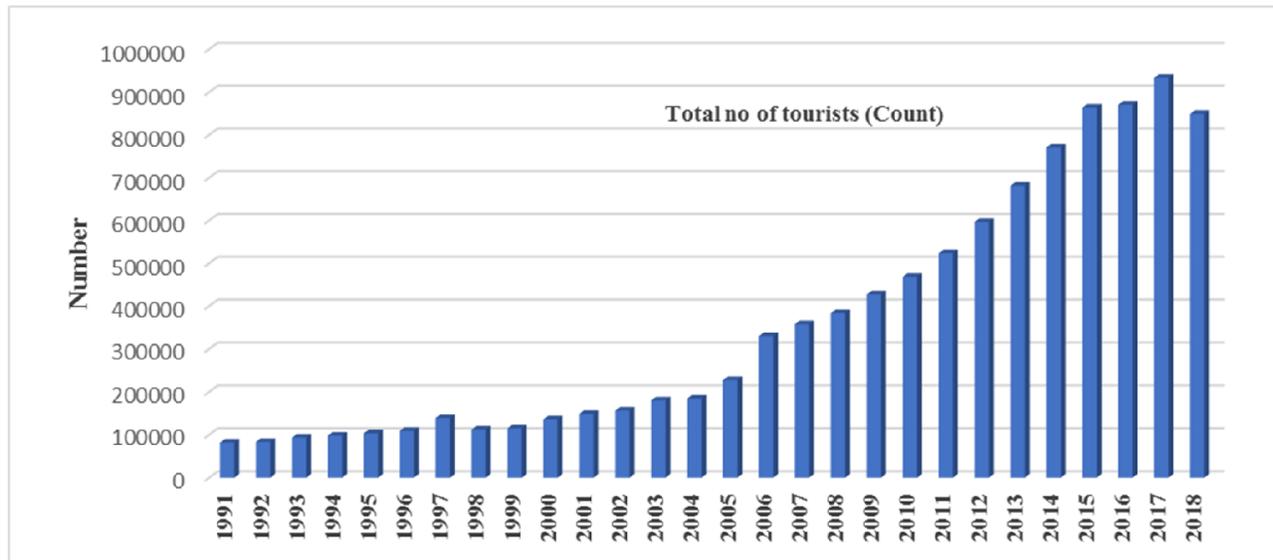


Figure1: Total number of tourists (1991-2018)

Source: Own computation, 2019

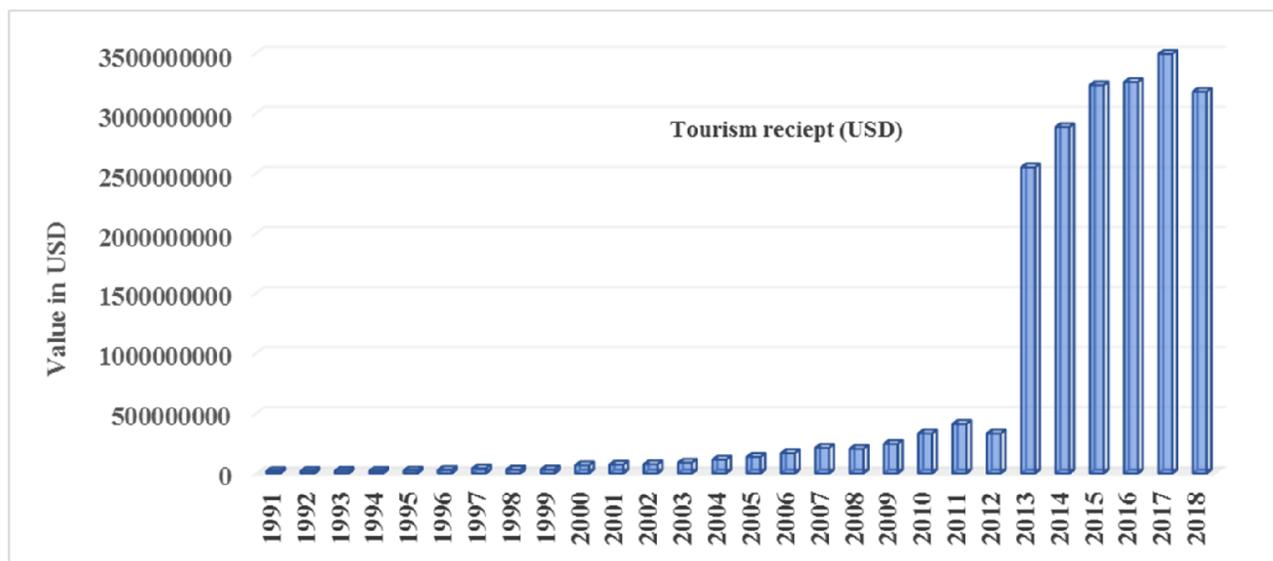


Figure 2: Tourism receipt (in USD)

Source: Own computation, 2019

As clearly reported in Figure-3 below, travel for leisure and holiday is the main reason tourists flow to Ethiopia. When we see the purpose of visits as of 2018, more than one third (37.2%) of the tourists travel to Ethiopia for leisure and holiday purpose. Transit and business tourism have also a considerable share in Ethiopian tourism sector which accounts 20.1% and 15.8% respectively.

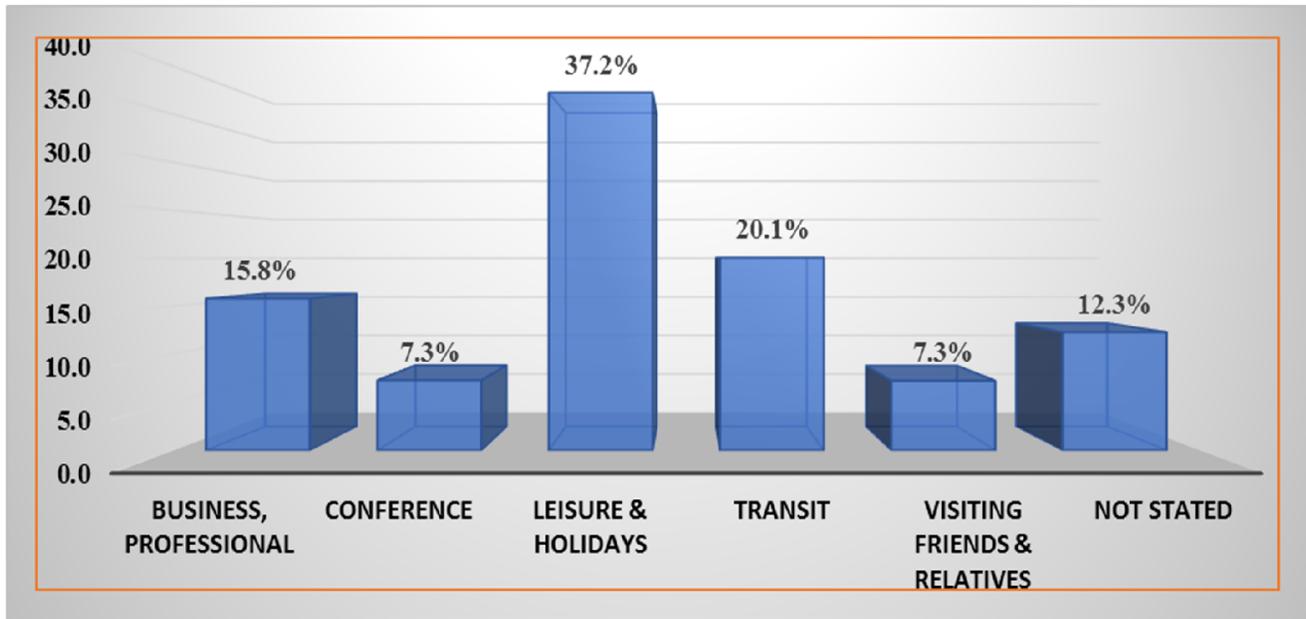


Figure3: Purpose of visit (2018)

Source: Own computation, 2019

Most of the tourists who visit Ethiopia in 2018 came from Africa (30%), Europe (29%) and Americas (21%). Specifically, most of the African tourists came from Nigeria, Kenyan, Sudan, South Africa and Djibouti. When we see the specific origin of the European tourists who visit Ethiopia in 2018 are from United Kingdom, Germany, Italy, France and Sweden.

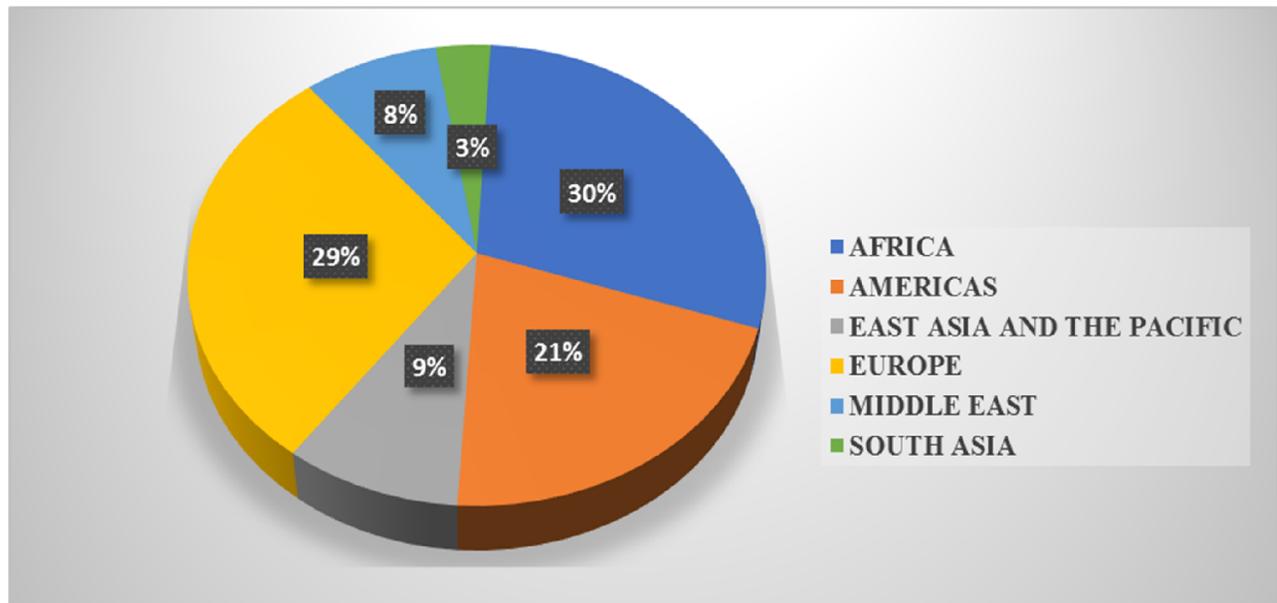


Figure 4: Tourist arrival by continents/regions (2018)

Source: Own computation, 2019

The top ten sources of tourism market to Ethiopia in 2018 are reported in Figure-5 below. The reported figures indicate that USA is the major sources of visitors to Ethiopia, accounting 17.4 % of the total visitors. Next to USA, China (about 6%) and United Kingdom (about 5%), Germany (about 4%), Italy (about 3.7%), France (3.2%), India (about 3%), Kenya (2.7%), Sudan (2.5%), and Saudi Arabia (2.5%) are the other major tourism market sources.

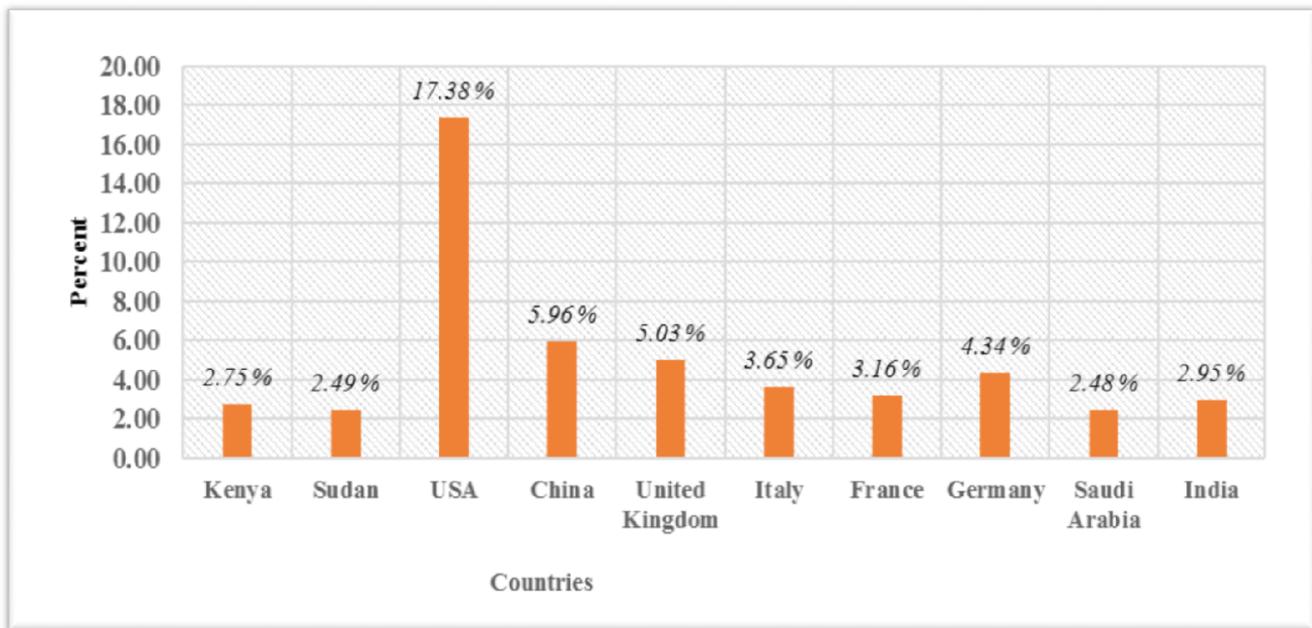


Figure 5: The top ten major sources of tourism market to Ethiopia (2018)

Source: Own computation, 2019

V. RESULTS AND DISCUSSION

5.1. Correlation matrix and Descriptive statistics

In order to have a general picture, the correlation matrix descriptive statistics about each variable over the period 1991-2018 is reported in Table 1. The mean of GDP per capita growth (PCGDPg), Gross Capital Formation growth (RGCFg), tourism receipt as a % of total export (TOUR) and secondary school enrollment growth (ENROLg) are about 4.14 %, 13.57%, 27.42 and 7.05% respectively. Over the period 1991-2018 real GDP per capita recorded a maximum growth of 10.41% and a minimum growth of -12.13%. On the other hand, tourism receipt as a% of total export reached a maximum value of 39.23% and a minimum value of 15.97%. The descriptive statistics also showed that only real per capita GDP growth is normally distributed with Jarque-Bera statistic of 7.66 and probability value of $0.023 < 0.05$. As displayed in the correlation matrix, the real GDP per capita, real gross capital formation, tourism receipt as a% of total export and secondary school enrolment are positively correlated. But gross enrollment is negatively correlated with real gross capital formation.

Table 1: Descriptive statistics and correlation matrix

Variables	PCGDPg	RGCFg	TOUR	ENROLg
Descriptive statistics				
Mean	4.141918	13.57019	27.42179	7.054133
Median	6.708212	13.47193	27.41000	5.801182
Maximum	10.40825	53.96966	39.23000	28.76501
Minimum	-12.12915	-27.60150	15.97000	-12.97040
Std. Dev.	6.296404	21.66090	7.267754	9.995834
Skewness	-1.248266	-0.071825	0.019662	0.046989
Kurtosis	3.574354	2.434140	1.683516	3.013330
Jarque-Bera	7.656314	0.397639	2.023790	0.010511
Probability	0.021750	0.819698	0.363529	0.994758
Correlation matrix				
PCGDPg	1.000000			
RGCFg	0.589833	1.000000		
TOUR	0.600094	0.300875	1.000000	
ENROLg	0.150382	-0.215982	0.249450	1.000000

Source: Author computation, 2019

5.2. Unit Root Test and Optimum lag selection

Before testing the long-run and short run association between the variables it is compulsory to examine the integrating properties of the variables. To do this, the standard *Augmented Dickey–Fuller* (ADF) and *Phillips–Perron*(PP) unit root tests were applied. Trend and intercepts are included in the tests. The results of the ADF test reported in Table-2 confirmed that PCGDPg and RGCFg are not subject to unit root problem at level with intercept at 1% level of significance. On the other hands TOUR and ENROLg are not stationary at level. This clearly shows that the integrating order of the variables is not unique rather a mixture of I (1) and I (0). The robustness of ADF unit root test is checked by applying PP unit root test. Accordingly, the results provided by ADF test are reliable and consistent. That means the PP unit root test validates that variables are a mixture of I (1) & I (0).

In order to determine the appropriate lag order, VAR lag order selection criteria was used. We have followed Schwarz information criterion (SIC) for choosing appropriate lag length due to its superior properties (Pesaran and Smith, 1998 and Liew, et.al. 2008). It has considerable high performance in selecting the true lag order, even if the sample size is small. The results reported in the Table-3 reflect that lag 1 is suitable for the sample size.

Table 2: Unit Root Analysis

Variables	ADF Unit Root Test			PP Unit Root Test		
	T-statistic	Prob.Values	Decision	T-statistic	Prob.Values	Decision
PCGDPg	-4.766992	0.0038**	Stationary	-5.086785	0.0018**	Stationary
TOUR	-2.704333	0.2426	Non-stationary	-2.730775	0.2330	Non-stationary
RGCFg	-6.834482	0.0000*	Stationary	-7.121911	0.0000*	Non-stationary
ENROLg	-3.498830	0.0597	Non-Stationary	-3.362228	0.0779	Non-Stationary
Δ PCGDPg	-7.537269	0.0000*	Stationary	-15.60970	0.0000*	Stationary
Δ TOUR	-6.367981	0.0001*	Stationary	-6.367981	0.0001*	Stationary
Δ RGCFg	-5.770887	0.0005*	Stationary	-30.11607	0.0000*	Stationary
Δ ENROLg	-6.401516	0.0001*	Stationary	-12.73066	0.0000*	Stationary

Source: Author computation, 2019

Note: Significance at 1% and 5% is shown by *and **respectively.

Table 3: Optimum lag of the model

Number of lags	AIC	SIC	HQIC
Lag 0	28.00844	28.20346	28.06253
Lag 1	26.47437*	27.44947*	26.74482*
Lag 2	26.63598	28.39116	27.12280
Lag 3	27.24141	29.77667	27.94458

Source: Author computation, 2019

Note: AIC= Akaike info criterion, SIC= Schwarz info criterion & HQIC= Hanan-Quinn info criterion. The lower the value of each criterion the best the model is in that lag order.

5.3. Cointegration results

After checking the unit root properties and identifying the appropriate lag length of the variables, the bounds test of cointegration is conducted in order to analyze the long-run relationship between the variables. Table 4 presents the calculated F-statistics and critical values for bound test. As can be seen from the table the calculated F-statistic = 5.895 and is greater than the upper bound critical value of 6.36 provided by Pesaran et al. (2001) at the 2.5% level of significance. Accordingly, the null hypothesis of no long-run relationship

is rejected. Therefore, the conclusion is that there is cointegration or a long-run relationship between RGDPg, TOUR, and the other control variable included in the model.

Table 4: ARDL Bounds Test

Sample: 1992-2018		
Included observations: 27		
Test Statistic	Value	k
F-statistic	5.895152	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	3.47	4.45
5%	4.01	5.07
2.5%	4.52	5.62
1%	5.17	6.36

Source: Author computation, 2019

After confirming the existence of a long-run relationship between the four variables included in the growth model, the long-run equation is estimated. Table 5 presents the results of the estimated long-run coefficients of the estimated growth model. The coefficients of all of the variables included in the model (except ENROLg) are statistically significant at 1%. Tourism receipt to export ratio (TOUR) and growth in gross capital formation (RGCFg) positively and significantly affects economic growth at 1% and 5% respectively. As expected, the recurrent drought dummy variable (DROU) and leadership change dummy (LEDCH) negatively and significantly affects real per capita GDP growth at 1% level of significance. The coefficient of tourism receipt to export ratio (TOUR) is about 0.964, suggesting that as the ratio of tourism receipt to export increases by 1percent, economic growth will increase by about 0.964 percent per year. This finding is consistent with the argument of tourism-led growth hypothesis (TLGH) which argued that international tourism is a source of economic growth through its contribution to foreign exchange revenues, stimulating greater investments in infrastructure, and creating employment opportunities that ultimately improve the living standard of the citizens of a country (Balaguer & Cantavella-J, 2002 ; UNWTo, 2017 and Risso & Bonapace, 2009). Since tourism is part of the current account balance, it can improve the persistent current deficit in Ethiopia and promote economic growth, if the current marketing and promotion strategy is further improved.

Table 5: Long Run Coefficients: *ARDL (1,0,0,0)*

Sample: 1991- 2018				
Included observations: 27				
Dependent Variable: PCGDPg				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
TOUR	0.963757	0.297680	3.237558	0.0043
RGCFg	0.142522	0.039883	3.573550	0.0020
ENROLg	0.026372	0.117502	0.224441	0.8248
DROUT	-6.226505	2.492930	-2.497666	0.0218
LEDCH	-6.771991	3.136158	-2.159327	0.0438
C	-15.442306	4.563227	-3.384076	0.0031
@TREND	-0.413604	0.232217	-1.781105	0.0909

Source: Author computation, 2019

5.4. Short run dynamics and ECM

The error-correction model presented in Table 6 shows that the one period lagged error-correction term is within acceptable levels. As expected, its magnitude is less than one and has a negative sign. Specifically, the coefficient of ECT which measures the speed of adjustment is about -0.895 and is statistically significant at 1%. This implies that approximately 89.5% of shocks from the previous period are corrected within the current year. This result implies that economic growth converges to its long-run equilibrium by 89.5% in one year with the speed of adjustment via the channel of tourism receipt and other control variables. As clearly indicated in Table 6, the short run effect of the explanatory variables is similar to the long run effect. The results show that tourism has a statistically significant positive impact on economic growth. This signifies that tourism acts as an engine of economic growth in the short-short-run as well.

Table 6: Short run coefficients: ARDL (1,0,0,0)

Sample: 1991-2018				
Included observations: 27				
Dependent Variable: Δ PCGDPg				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Δ TOUR	0.862899	0.209997	4.109100	0.0006
Δ RGCFg	0.127607	0.038490	3.315364	0.0036
Δ ENROLg	0.023612	0.107808	0.219022	0.8290
DROUT	-5.574895	1.950202	-2.858624	0.0101
LEDCH	-6.063296	2.186962	-2.772475	0.0121
@TREND	-0.370320	0.184390	-2.008348	0.0590
ECT (-1)	-0.895349	0.183574	-4.877316	0.0001

Source: Author computation, 2019

5.5. Diagnostic test

The soundness of the results is dependent on the fit and stability of the model. Therefore table 7 summarizes the results of the various diagnostic and stability tests of the TLGH model. Based on the Breusch-Godfrey serial correlation LM Test, there is no serial correlation in the model. AS proved by the Jarque–Bera normality test, the residuals are normally distributed in the model. The model also appears not be heteroscedastic as it passes the Breusch-Pagan-Godfrey heteroskedasticity tests. The Ramsey RESET test results also confirm that the model is correctly specified and stable.

Table 7: Diagnostic test

F-statistics and P-values	Types of Tests				
	χ^2SC	χ^2H	χ^2ARCH	χ^2N	Ramsey Reset Test
Calculated F-statistics	0.28541	1.2537	0.35708	0.8451	2.86642
P-values	0.75520	0.3238	0.5557	0.6554	0.0846

Source: Author computation, 2019

Note: χ^2SC = Breusch – Godfrey Serial Correlation LM Test , χ^2H = Breusch-Pagan-Godfrey test for heteroscedasticity, χ^2ARCH = ARCH test for heteroscedasticity, χ^2N = Jarque-Bera normality Test. Ramsey Reset test was performed based on the squared fitted values.

Further, the level of multicollinearity is also tested in terms of Variance Inflation Factor (VIF). Accordingly, the VIF (centered) values reported in Table 8 clearly shows that there is no multicollinearity problem.

Table 8: Variance Inflation Factors

Sample: 1991- 2018		
Included observations: 27		
Variables	Coefficient Variance	Centered VIF
PCGDPg	0.033699	2.761488
RGCFg	0.001481	1.826089
TOUR	0.044099	7.216206
ENROLg	0.011623	2.513194
DROUT	3.803288	2.710461
LEDCH	4.782801	2.421671
C	11.65733	NA
@TREND	0.034000	6.069592

Source: Author computation, 2019

5.6. Pairwise Granger causality results

In order to identify the direction of causality between international tourism receipt and economic growth in Ethiopia, pair wise Granger-causality test was conducted. The test result indicated that causality runs from tourism receipt to economic growth. At a lag length of one and two there is a uni-directional Granger causal relationship from tourism receipt to economic growth. This implies that the tourism-Led economic growth hypothesis is valid in Ethiopia.

Table 9: Pairwise Granger Causality Tests

Sample: 1991- 2018			
Lags: 1			
Null Hypothesis:	Observation	F-Statistic	Prob.
TOUR does not Granger Cause PCGDPg	27	6.67277	0.0163
PCGDPg does not Granger Cause TOUR		0.07455	0.7872
Lags: 2			
Null Hypothesis:			
TOUR does not Granger Cause PCGDPg	26	7.84092	0.0029
PCGDPg does not Granger Cause TOUR		0.15807	0.8548

Source: Author computation, 2019

VI. CONCLUSION AND RECOMMENDATION

The main objective of this study was to validate the Tourism-Led growth hypothesis (TLGH) in Ethiopia over the period 1991-2018. The cointegration test result indicates that there is a long run relationship between tourism receipt, economic growth and other control variables. The results of the pairwise Granger causality test also predicted unidirectional causality running from tourism receipt to economic growth. This validates that the tourism-led growth hypothesis works for Ethiopia. This result is consistent with the finding of Cantavella-Jorda (2002) for Spain, Grillon (2013) for Dominican, Ay, Kartal, & Arslan (2015) for Turkey, Ohlan, (2017) for India, Shih and Do (2016) for

Vietnam. Hence, appropriate resources and efforts should be directed towards promoting and developing the untapped tourism industry of the country to augment economic growth. Besides, any intervention related to the sector has to be integrated into the broad national development plan and other universal value chains. In addition, a comprehensive primary survey on the bottlenecks of the sector should be undertaken so as to solve the real challenges of the sector at the grass root level. This enables to further maximize the effect of tourism on the socio-economic development of the country.

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Laws of Authority and Uncertain Law On the Beach Reclamation Activities in The Gulf Coast of Jakarta

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Abstract- Conflict of authority and legal uncertainty related to coastal reclamation in coastal areas and small islands surfaced in almost reclamation activities in the area, especially the implementation of reclamation in the Jakarta Bay. Although the reclamation at Ancol Beach was successful in the 1980s, it does not guarantee that the reclamation will run smoothly and successfully in the era of regional autonomy. Various regulations have emerged that regulate reclamation activities and the authority to manage coastal and small islands. Such a lot of rules actually makes stakeholders more uncertain to use what regulations are in accordance with the interests of their respective regions. Coastal reclamation in the era of regional autonomy has caused many conflicts in the community, demonstrations of reclamation rejection, and lawsuits in the State Administrative Court. Regarding reclamation in Jakarta Bay, governor Basuki Tjahaja Purnama (Ahok) gave reclamation permission, but when Governor Ahok was replaced with Anies Baswedan, the reclamation permit was canceled. This causes legal uncertainty especially for entrepreneurs, which results in entrepreneurs filing a lawsuit against the Provincial Government of DKI Jakarta.

Index Terms- Coastal Reclamation, Reclamation Authority, and Legal Certainty

I. INTRODUCTION

Indonesia is the largest archipelago country in the world consisting of 17,499 islands from Sabang to Merauke.¹ Data from the Ministry of Home Affairs (2006), Indonesia is inhabited by around 17,504 islands. The amount is different compared to the count of the Toponimi Team which is coordinated by the Directorate General of Marine, Coastal and Small Islands, Ministry of Maritime Affairs and Fisheries (DKP). The total area of Indonesia is 7.81 million km² which consists of 2.01 million km² 3.25 million km² of the sea, and 2.55 million km² of the Exclusive Economic Zone (EEZ)². It is estimated that 3/4 of

Indonesia (5.8 million km²) is ocean and a quarter (1.9 million km²) is land area.³ With the adoption of the 1982 United Nations Law of the Sea Law (*United Nations Convention on the Law of the Sea* 1982 - UNCLOS 1982) which was ratified by RI Law No. 17 of 1985, Indonesia's territory expanded to approximately 8.5 million square kilometers. In addition, UNCLOS has opened a new chapter on the demarcation of territorial borders and jurisdictional authority at sea, where in this connection the Unitary State of the Republic of Indonesia as an "Archipelagic State" legally has territorial borders and jurisdictional authority over inland waters, archipelagic waters, territorial seas, Zone Exclusive economy, free sea, and clearer continental shelf and international seabed.⁴

The first reclamation in Indonesia was carried out at Ancol Beach in Jakarta in the early 1960s. The Ancol area is located east of Jakarta's Old City, to the border of the Tanjung Priok Port complex. The area is now used as a village of the same name, including the Pademangan sub-district, North Jakarta Municipality. The reclamation has succeeded in transforming the Ancol Beach area into the largest tourist destination in Jakarta visited by domestic and foreign tourists. Ancol Beach, which is owned by the DKI Jakarta Regional Government, even produces the second highest local revenue (PAD) after Bank DKI. The Ancol Beach reclamation goal has been achieved, so that it becomes an inspiration for other entrepreneurs to conduct similar reclamations in the Jakarta Bay.

Based on Act Number 32 of 2004 concerning Regional Government, each regency / city which has a coastal and sea boundary is given the authority to utilize the beach and the sea. Areas that have sea areas are given the authority to manage marine resources (Article 18 paragraph 1 of Act No.32 / 2004). The authority to manage the resources in the sea area at most 12 (twelve) nautical miles is measured from the coastline towards the open sea and / or towards archipelagic waters for the province and 1/3 (one third) of the provincial authority for the district / city . However, when Act No. 32/2004 was replaced with Act Number

¹ Surat Edaran Kepala Dishidros Mabes TNI-AL No.SE/1241/IV/2012 tanggal 10 April 2012 tentang Data Wilayah Negara Kesatuan Indonesia.

² Luky Adrianto, Laporan Analisis dan Evaluasi Hukum tentang Pengelolaan Wilayah Pesisir dan Pulau-Pulau Kecil, Pusat Perencanaan Pembangunan Hukum Nasional, Badan Pembinaan Hukum Nasional Kementerian Hukum dan Hak Asasi Manusia RI tahun 2015.

³ Bambang Iriana Djajaatmadji, Harmonisasi Hukum Pengelolaan Sumber Daya Kelautan Dalam Kerangka Desentralisasi, Badan Pembinaan Hukum Nasional, Departemen Hukum dan Hak Asasi Manusia RI, Jakarta, 2005.

⁴ Ibid

23 of 2014, the authority of regency / city areas to manage coastal areas and small islands was revoked. Article 27 paragraph (1) of Act No. 23/2014 states that the Provincial region is given the authority to manage the existing marine resources in its territory. This article invalidates Article 18 paragraph (1) of Act No. 32 of 2004, which states that regencies / cities that have sea areas are given the authority to manage resources in the sea area.

Conflicts related to the enactment of legislation also occurred in Presidential Regulation No. 52 of 1995 concerning the Implementation of the North Coast Reclamation of Jakarta, and Presidential Decree No. 122 of 2012 concerning Management of Coastal Areas and Small Islands. The two regulations can lead to different interpretations in the implementation of reclamation in Jakarta Bay. If using Perpres 52/1995, the reclamation on the North Coast of Jakarta is the authority of the governor of DKI Jakarta. However, if referring to the Presidential Decree 122/2012, to obtain a location permit and permit for the implementation of the reclamation must undergo a long process in several related ministries.

II. RECLAMATION BEFORE REGIONAL AUTONOMY

The beach reclamation in the Jakarta Ancol Beach area, by PT Pembangunan Jaya Ancol owned by the Provincial Government of DKI Jakarta in collaboration with the private sector, in the early 1980s, was successfully carried out successfully and successfully. Originally the Ancol area, which covered an area of 552 hectares, would be used as an industrial area. The President of the Republic of Indonesia, Ir. Soekarno then came up with an idea to change its designation, not for an industrial area but a tourist area. For this reason, the President of the Republic of Indonesia, Ir. Soekarno, then appointed the DKI Jakarta Regional Government, in this case Governor Dr. H. Soemarno Sosroatmodjo as the executor. Development funds obtained from foreign and domestic loans.⁵

In accordance with Presidential Decree 338/1960, the Governor of the Greater Jakarta Region is determined as the Responsible for the smooth implementation of the Ancol development, therefore in the framework of implementing the Presidential Decree, the Governor of the Greater Jakarta Region through his decision No. 11 / Seker / Antjol on 30 March 1961 formed the Implementing Agency and the Ancol Project Development Control Agency.

In 1966, the Governor of the Greater Jakarta Region through Decree No. 1b.3 / 1/26/1966 dated 19 October 1966 appointed PT Pembangunan Capital Jakarta Raya ("PT Pembangunan Jaya") as the Ancol Project Development Implementing Agency. The Governor's Decree was renewed by Decree No.1b.3 / 1/59/66 dated November 25, 1966 and finally by Decree No. 1b.3 / 1/5/70 dated January 14, 1970. Official reclamation activities were only carried out in 1980 when the Governor of the Jakarta KDKI issued a Jakarta KDKI Decree No. 812 of 1980 (Decree 812/1980) concerning the Implementation of Reclamation in the Ancol Project, dated July 26, 1980.

III. RECLAMATION IN THE ERA OF REGIONAL AUTONOMY

The implementation of beach reclamation in the era of regional autonomy is increasing. Minister of Maritime Affairs and Fisheries Susi Pujiastuti stated that currently there are 37 locations that will be developed through reclamation, 17 are reclaiming and 20 will be reclaiming. Reclamation in Indonesia include: Jakarta Bay, covering an area of 5,153 hectares; Bali's Benoa Bay (883 hectares) and Serangan Bali Island (379 hectares); in Manado there is Bitung Beach (534 hectares), Tanjung Merah Beach (1,000 hectares), Boulevard Beach (76 hectares), Teluk / Manado Beach (150 hectares); Kenjeran Beach Surabaya (320 hectares), Losari Makassar Beach (4,000 hectares), Center Point of Indonesia - CPI Project, in Makassar (157 hectares); Marina Semarang Beach (232 hectares), Talise Palu Beach (3,833 hectares), Balikpapan Bay (329 hectares), Ternate Swering Beach (3,833 hectares); Lamongan Beach (62 hectares); Pantai Tapak Tuan Aceh and Delta Berbak Jambi.

The success of the reclamation at Jakarta's Ancol Beach in the early 1980s inspired the government to make Jakarta's North Coast a Mainstay Area. This was stipulated through Presidential Decree No. 17 of 1994 which declared the Jakarta Pantura as the Mainstay Area. A year later, Presidential Decree No. 52 of 1995 concerning the Implementation of the Jakarta North Coast Reclamation, which was followed up with Jakarta's Regional Regulation No. 6 of 1999 concerning DKI Jakarta Regional Spatial Planning. The purpose of the reclamation is to increase, namely for international trade and services, housing for the upper middle class and tourist ports.

Legal conflicts began to emerge when the 2003 Ministry of Environment issued Decree No. 14 of 2003 concerning the Ineligibility of the Plan for the Reclamation and Revitalization of the North Coast of Jakarta. According to the KLH study, reclamation increases the risk of flooding, especially in the northern region, damaging marine ecosystems, causing fishermen income to decline, and disruption of the Muara Karang power plant. This decision was sued by 6 entrepreneurs who did the reclamation until the Supreme Court decision came out that won the lawsuit of 6 entrepreneurs in 2011.

When the entrepreneurs won the case, the governor continued the process of reclamation permits. August 2012 Fauzi Bowo issued an implementation permit as a continuation of the principle license from Sutiyoso for Island 2A, which was then referred to as Island D, to PT Kapuk Naga Indah. On September 19, 2012, Fauzi Bowo issued Governor Regulation No. 121/2012 concerning Spatial Planning for the North Jakarta Reclamation Area. For the first time the DKI Jakarta Government revealed that there will be 17 islands named Island A to Q Island with a total area of 5,155 hectares. Pergub projects there will be 750,000 new residents on the 17 new islands. Then, on September 21, 2012, DKI Jakarta Governor Fauzi Bowo issued principle licenses for the islands of F, G, I, and K.

⁵ Departemen Hukum PT Pembangunan Jaya Ancol, Tbk, Kronologi Pembentukan Pt Pembangunan Jaya Ancol, TBK, Jakarta, 2005, p. 5.

IV. CONFLICT OF AUTHORITY AND LEGAL UNCERTAINTY

In the era of governor Ahok, on December 23, 2014 the DKI Jakarta Government issued a permit for the implementation of the reclamation of Pulau G owned by Agung Podomoro Land Company, PT Muara Wisesa Samudra. But in April 2015, the Minister of Maritime Affairs and Fisheries Susi Pudjiastuti asked the DKI Regional Government to stop reclamation on the grounds that it was the authority of the central government. The DKI Regional Government responded by saying that the reclamation of 17 islands is not part of the NCICD, thus it is the authority of the regional government in accordance with the 1995 Presidential Decree regarding Jakarta Bay reclamation.

If the governmental duties as a government organizer are equipped with authority which according to positive law has been determined and regulated, then legal actions (valid according to law) need not be a concern. That is why when governor Ahok based on Keprrres 52/1995 provisions decided to grant reclamation permits to developers in Jakarta Bay, it should not be able to be intervened by the Central Government, because the authority granted to the governor as regulated in Presidential Decree 51/1995 is very strong and specific specifically for reclamation in Jakarta's North Coast. However, it turned out that the governor's authority was deemed to be flawed so that in September 2015, the Indonesian Forum for the Environment (Walhi), the People's Coalition for Indonesian Fisheries Justice (Kiara), and a number of Muara Angke fishermen sued the Jakarta administration for issuing permits for Pulau G for Pluit City in Pluit City in State Administrative Court (PTUN). The lawsuit was won by the fishermen and decided on May 31, 2016. However, the Panel of Judges at the State Administrative High Court (PTTUN) overturned the previous decision and won the defendant DKI Governor Basuki Tjahaja Purnama on the basis that the lawsuit filed by the fishermen to the PTUN had expired, because has passed 90 days after the permit was issued in 2014.

In February 2016, the Indonesian Forum for the Environment (Walhi), the Indonesian Traditional Fishermen Coalition (KNTI), and the Muara Angke fishermen sued the regional government for issuing permits for the implementation of islands F, I, and K in the PTUN by the Governor of DKI Jakarta. All these claims were won by KNTI and fishermen as per the Judges' verdict. "Declaring the decision of the Governor of the Jakarta Special Capital Region Province No. 2486 of 2015, concerning the granting of a permit for the implementation of K Island reclamation to PT Pembangunan Jaya Ancol, tbk. "Likewise the decision on Island F made by PT Jakarta Propertindo (Jakpro), and the ruling on Island I by PT Jaladri Kartika Ekapaksi, on March 16 2017. The judges cancel all reclamation licenses held by employers and prohibit reclamation activities until the decision has permanent legal force.

After Anies Baswedan became Governor on October 16, 2017, a year later the reclamation of the North Bay of Jakarta was stopped with the provision that 13 island licenses were revoked including the A, B and E Island permits owned by PT Kapuk Niaga Indah, the J and K Island permits by PT Pembangunan Jaya Ancol, Pulau L and M licenses by PT Manggala Krida Yudha, Pulau O and F permits by PT Jakarta Propertindo (Jakpro), Pulau P and Q licenses by Marunda KEK Jakarta, Pulau H permits by PT Tunas Harapan Indah, and Pulau I by PT Jaladri Kartika Eka Paksi. Whereas the four islands that are retained are Pulau C and D which

are owned by PT Kapuk Naga Indah, Pulau G is owned by PT Muara Wisesa Samudera, and Island N is owned by PT Pelindo II. The event of revocation of the reclamation permit in Jakarta Bay by Governor Anies Baswedan, for economic actors or business people can result in a decrease in confidence in legal certainty in Indonesia. All business actors need legal certainty in every investment made, including a very large reclamation investment. If the permit given by the previous governor (Ahok), then canceled by the next governor (Anies), will cause a huge loss among entrepreneurs who have obtained official permission from the previous authorized official.

V. UPCOMING BEACH RECLAMATION CONCEPTS

In line with the spirit of Regional Autonomy where according to Law Number 23 of 2014 concerning Regional Government in Article 1 point (6) states that "regional autonomy is the right, authority and obligation of autonomous regions to regulate and manage their own government affairs and the interests of local communities in accordance with legislation". In the case of delegation of authority to the regional government in the field of environmental management it is intended to increase the role of local communities in environmental protection and management.

The principles of participatory, local wisdom, good governance, and regional autonomy provide directions that the government and local government in managing and managing the environment must be imbued with the principles of participation, transparency, accountability, efficiency, and justice, by encouraging community members to play an active role in the process decision making and implementation of environmental protection and management and pay attention to the noble values that apply in people's lives. Therefore, based on these principles, the government and regional governments must not ignore the interests of the community in the implementation of government affairs in the field of environmental protection and management. Environmental protection and management must be carried out properly based on community interests.

VI. CLOSING

This contradicts Article 1 point 1 and article 1 point 41, Act No. 27/2007 concerning Management of Coastal Areas and Small Islands. It is stated that the Management of Coastal Areas and Small Islands is a process of planning, monitoring, and controlling Coastal and Small Islands Resources between sectors, between the government and the Regional Government, between terrestrial and marine ecosystems, and between science and management to improve public welfare (Article 1 point 1), while the Regional Government refers to the governor, district head or mayor, and regional apparatus as elements of regional governance (Article 1 point 41).

Revocation of authority is not in line with the 1945 Constitution Article 18 paragraph (5), Article 18 A paragraph (1), Article 18 B paragraph (2), and Article 33 paragraph (3), and is contrary to the principle of regional autonomy, namely regional autonomy breadth, where each region has the authority to regulate matters of government and regulate the interests of society.

The government must restore the authority of the regency / city area, as stated in Article 18 of Act No.32 / 2004, namely the authority to manage resources in the sea area at most 12 (twelve) nautical miles measured from the coastline towards the open sea and / or in the direction of archipelagic waters for the province and 1/3 (one third) of the province's jurisdiction for the district / city. The President must provide policy directives regarding the emergence of overlaps and understanding of the enactment of Presidential Decree 52/1995 on the Implementation of reclamation on the North Coast of Jakarta and Perpres 122/2012 on Management of Coastal Areas and Small Islands.

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The Nature of Termination of Criminal Criminal Attendance Based On Restorative Justice

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Abstract- In Indonesia the development of the concept of Restorative Justice is something new, Restorative Justice is a form of justice that emphasizes the involvement of all parties involved in a particular crime, both the victim, the perpetrator and the community to jointly solve the problem in dealing with the consequences of the crime, with orientation to improve, create reconciliation and satisfy all parties. As diversified, Restorative Justice is carried out outside the formal process through the court to demonstrate law enforcement and a sense of justice properly. Every investigation of a criminal case is not impossible to find a dead end so that it is no longer possible to continue the investigation. In such situations, the investigator is given the authority to terminate the investigation. The Criminal Procedure Code specifies a limited reason used to stop the investigation. Based on the above background description, the authors formulate the problems that become the topic of discussion in this dissertation are as follows: What is the nature of stopping investigations for the sake of law? What is the concept of terminating investigations for the sake of law based on restorative justice? .Research Objectives To analyze and find the nature of the termination of investigation by law. To analyze and find the concept of terminating the investigation by law based on restorative justice. To answer the problems that have been formulated in this study, research methods are used, namely normative legal research (Normative juridical). Normative Legal Research (normative juridical) is a legal research method conducted by examining mere library materials or secondary data. This research was conducted to identify the concepts and principles and principles of sharia that are used to regulate police authority with restorative justice in stopping criminal case investigations. The method of thinking used is the method of deductive thinking (a way of thinking in drawing conclusions drawn from something of a general nature that has been proven that he is right and the conclusion is intended for something of a special nature). The origin of the research is the relationship between the nature and the concept in restorative justice. It is found that there is a lack of clarity between the reality and the rules. hesitant in taking the decision, even though there have been reasons for the abolition of the right to sue and loss of the right to carry out the crime, that is because nebis in idem, the suspect died, or because the criminal case has expired, and there is not enough evidence. A cessation of investigations carried out by investigators must be truly accountable, in the sense that the cessation of such investigations is based on the facts that occur which by law must stop the investigation. Substantially Restorative Justice as a guideline in the implementation of Restorative Justice established

based on the principles of the formation of the National legal system, is declared to be able to integrate criminal justice mechanisms with police discretion

Index Terms- Restoration Justice, No Criminal Case Light, No Violation of the Law

I. INTRODUCTION

In Indonesia the development of the concept of *Restorative Justice* is something new, Restorative Justice is a form of justice that emphasizes the involvement of all parties involved in a particular crime, both the victim, the perpetrator and the community to jointly solve the problem in dealing with the consequences of the crime, with orientation to improve, create reconciliation and satisfy all parties. As diversified, *Restorative Justice* is carried out outside the formal process through the courts to demonstrate the rule of law and a sense of justice properly.

Knowing the pillars of state administration in Indonesia in an essential state law one of which is: concerning the justice system. However, until now the justice system in Indonesia is still faced with a number of problems even though various improvements and / or repairs have often been done. System improvements that have been made have not provided satisfactory answers for justice seekers.

Legal issues seem to be one of the phenomena that never subsides in social, national and state life. As the phenomenon of legal problems increases, so does the study of law which aims to explore various problems from the perspective of existing laws and regulations. Criminal offense is not solely as a revenge but rather as a goal to influence human behavior in accordance with the rule of law. The most important thing is the provision of guidance and protection, especially for cases of bad children. The handling of criminal cases with the *Restorative Justice* approach offers a different perspective and approach in understanding and handling a crime. In the view of *Restorative Justice*, the meaning of a criminal act is basically the same as the view of criminal law in general, namely: attacks on individuals and society and social relations. This incident was caused because he took 3 pieces of cocoa belonging to PT RSA 4, and this action was discovered by the foreman. The act was also reported to the police. Counting since October 19, 2009 the case of cocoa theft that involved Minah's grandmother had been handled by the Purwokerto District Attorney's Office. He was charged with taking other people's belongings without permission. Namely picking three cocoa weighing 3 kg from the plantation owned by PT Rumpun Sari

Antan 4. How much is the loss for the theft of Rp 30,000 according to prosecutors. Or Rp 2,000 in the market .. As a result of his actions Grandma Minah was charged under article 362 of the Penal Code. With the threat of a sentence of six months in prison.

II. DISCUSSION

Police In Handling Criminal Cases Through *Alternative Dispute Resolution* (ADR)

ADR (Alternative Dispute Resolution) is relatively new in Indonesia, but actually consensus dispute resolutions have long been carried out by the community, which in essence emphasizes the deliberation of consensus agreements, kinship, peace and so on. Choice of Dispute Resolution or also referred to as Alternative Dispute Resolution, which in foreign terms is called Alternative Dispute Resolution, hereinafter abbreviated as ADR, is a concept that covers various forms of dispute resolution other than the judicial process through lawful ways, both based on consensus approach, such as negotiation, mediation and conciliation or not based on a consensus approach, such as arbitration. Arbitration takes place on the basis of an *adversarial* approach (dispute) that resembles a judicial process so as to produce a winning and losing party.

Observers and practitioners discussing *Restorative Justice* so far victims are essentially excluded from the traditional criminal justice process. Victims are only needed as witnesses if needed, but in their decision-making policy they are not involved at all. Decision making is only done by a judge based on examination during the court process. "For the perpetrators of their involvement in the court is only passive, most of their participation and participation are represented and voiced by their lawyers.

To realize the ideals of justice aspired so that a view of *Restorative Justice* emerges. The idea of *Restorative Justice* first appeared among criminal law experts as a reaction to the negative impact of applying criminal law (sanctions).

Restructuring with the presence of *Restorative Justice* implies restructuring of *Restorative Justice*. In relation to rearranging the building of the Indonesian criminal law system, the term restructuring is very close to the meaning of reconstruction, namely: rebuilding the national criminal law system. So the two terms are very closely related to the problem of *law reform* and *law development*, specifically relating to reform or development of the criminal law system (*penal system reform / development* or often referred to briefly with the term *penal reform*).

III. LAW AS THE BEHAVIOR OF POLICE INVESTIGATORS IN REALIZING LAW ENFORCEMENT

Law enforcement is a series of processes to describe values, ideas and ideas that are quite abstract which are the objectives of law. The purpose of the law or the ideals of the law contains moral values such as justice and truth, these values must be able to be surprised in real reality. Law enforcement as a means to achieve legal objectives, then all personnel should be mobilized so that the law is able to work to realize moral values in the law, failure of the law to realize the legal value is a dangerous threat to the weakness of the existing law.

Laws that are poor / weak in their implementation of moral values will be distant and isolated from their communities. And the success of law enforcement will determine and become a barometer of the legality of law in the midst of social reality. The law is made to be implemented, therefore the law cannot be separated from the community as the basis for the operation of the law.

The main objective of *Restorative Justice* is to empower victims, where perpetrators are encouraged to pay attention to recovery. *Restorative justice* places great importance on meeting the victims' material, emotional and social needs. "The success of *Restorative Justice* is measured by how much the loss has been recovered by the perpetrators, not measured by how heavy the criminal dropped by the judge. In essence, as far as possible the perpetrators were expelled from criminal proceedings and from prison.

In reality the law cannot strictly be applied to anyone or under any conditions as stated in the legislation. Things like this in criminal law are not only not in accordance with the purpose of criminal law, but will bring the consequences of people's lives to be heavy, difficult and unpleasant. Caused because all movements of community activities are regulated or sanctioned by regulations. To overcome this, it is left to the law enforcement officials themselves to test and screen each case that is entered for processing, this is called discretion.

IV. THE PURPOSE OF IMPLEMENTING RESTORATIVE JUSTICE IN LIGHTLY CRIMINAL CASES

The purpose of *restorative justice* is an effort or a new model approach in Indonesia that is very close to the principle of deliberation which is the soul of the nation (*volksgeist*) Indonesia itself. to provide the best solution in resolving private crime cases between people (*natuurlijkpersonen*) or legal entities (*recht personen*) by giving priority to the core problems of a crime.

Important Settlement Objectives to pay attention to is the improvement of the social order of people who are disturbed due to crime. *Restorative justice* focuses on the process of criminal responsibility directly from the perpetrator to the victim and the community, if the perpetrators and victims and the community violated their rights feel they have achieved a justice through joint deliberation efforts then punishment (*ultimum remedium*) can be avoided.

The application of restorative justice in criminal offense cases gives a freedom to the public in solving problems in the community in this case the resolution of minor criminal cases. The mediation may be used in the process of settling cases outside the conventional court, as part of restorative justice

V. CASE RELIEF INSTITUTIONS FOR THE PUBLIC INTEREST

Currently in the legal system in Indonesia, it has begun to lead to the adoption of the *Restorative Justice* concept. But for the time being, it is still partially enforced and sees a very basic level of urgency, which can be found in Act Number 11 of 2012 concerning the Juvenile Justice System.

As affirmed in Article 1 number 6 of the Law on the Juvenile Justice System, which confirms as follows: *Restorative*

Justice is the settlement of criminal cases involving the perpetrators, victims, the perpetrators / victims' families, and other related parties to jointly seek a solution fair by emphasizing restoration back to its original state, and not retaliation.

VI. CONCLUSION

The relationship between nature and concepts in restorative justice is found to be unclear between reality and rules. Findings in the legal problems of this dissertation, there are obscurity of norms and it is not easy to cease investigations by law. Doubt in taking the decision, even though there have been reasons for the abolition of the right to sue and loss of the right to carry out the crime, which is due to the fact that *nebis in idem*, the suspect died, or because the criminal case has expired, and there is not enough evidence. A cessation of an investigation carried out by an investigator must be truly accountable, in the sense that the cessation of the investigation is based on the facts that occur which by law must stop the investigation.

Substantially *Restorative Justice* as a guideline in the implementation of *Restorative Justice* formed based on the principles of the formation of the National legal system, it is stated that *Restorative Justice* and criminal case investigations can be carried out combining criminal justice mechanisms with police discretion in a mediation deliberation to obtain an agreement between victims, perpetrators, the victim's family, the perpetrator's family, as well as parties related to criminal cases. It is recommended according to the findings so that in the process of police investigations in handling criminal cases and *Restorative Justice* the Indonesian National Police instinct will reform the criminal law system and be able to contribute through the role of the policy to be built in the upcoming Criminal Procedure Code. Commitments from very mild criminal investigators can begin with termination and compensation, as well as the realization of restorative justice from all criminal law enforcement cases.

It is hoped that the Indonesian National Police will be able to apply law enforcement based on *Restorative Justice* as a form of commitment to the Indonesian National Police's performance to meet legal certainty and a sense of justice in society.

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Comparative Adsorption Studies of Hexavalent Chromium Ion On Acid-Modified and Raw Mangrove Sorbents

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Abstract- Adsorption capacities of acid-modified (MoMB and MoMR) and raw (RaMB and RaMR) mangrove bark and root sorbents on hexavalent chromium ion have been evaluated with respect to pH, adsorbent dosage, particle size, concentration of hexavalent chromium ion and contact time using batch adsorption technique. It was found that acid-modified mangrove sorbents exhibited higher adsorption capacities than raw mangrove sorbents. The adsorption of hexavalent chromium on both modified and unmodified mangrove biomass was found dependent on all variables considered. However, adsorption capacity decreased with increasing pH, adsorbent dosage and particle size but increased with contact time and concentration of hexavalent chromium ion. Adsorption data fitted best with Freundlich isotherm model. Kinetic study of the adsorption process favoured both first and second order models, suggesting physisorption and chemisorption, for MoMB and MoMR. The study revealed that acid-modified mangrove extracts are better adsorbents than raw mangrove extracts for the removal of hexavalent chromium ion from aqueous solution.

Index Terms- Hexavalent chromium ion, mangrove bark, mangrove root, adsorption capacity, particle size

I. INTRODUCTION

Chromium, a common heavy metal pollutant, exists in several oxidation states with the trivalent and hexavalent states as the most stable. Hexavalent chromium is more toxic than the trivalent form and primarily present in aqueous environment as chromate (CrO_4) and dichromate (Cr_2O_7) [1]. Salts of hexavalent chromium are very soluble and easily absorb and accumulate chromium metal in human body with subsequent detrimental impact on public health and the environment. In the past, conventional methods such as electrolytic, chemical precipitation, reverse osmosis, solvent extraction, reduction, ion exchange and adsorption on activated carbon were employed in the removal of hexavalent chromium from aqueous solutions. Due to environmental preservation and reduction of high operational cost associated with these conventional methods, researchers are continuously investigating the efficiency of various plant materials in adsorbing and thus removing hexavalent chromium ion from aqueous media [2 - 6]. The study of the adsorption of

chromium (VI) by modified and unmodified mangrove leaf sorbents has been reported [7]. In this companion study, the efficiencies of modified mangrove bark and root (MoMB and MoMR) extracts and raw mangrove bark and root (RaMB and RaMR) extracts in removing hexavalent chromium ion from aqueous solution was investigated using batch adsorption process. The objective of this paper was to evaluate and report the adsorption capacities of acid-modified and raw mangrove bark and root sorbents on hexavalent chromium ion. The influence of process variables such as pH, adsorbent dosage, particle size, hexavalent chromium concentration and contact time were also stated.

II. MATERIALS AND METHOD

2.1 Collection of Mangrove Plant Parts (Adsorbent):

Mangrove bark and root were collected from coastal forest near Bakana, a riverine community in Degema Local Government Area of Rivers State, Nigeria. Samples were washed thoroughly with tap water to remove dirt and soil particles and sun dried for 5 days to obtain completely dried biomass. The dried samples were milled to powder with a mechanical grinder, sieved into 5 different sizes using test sieves of different mesh sizes (150, 500, 1000, 1200 and 2000 μm) and stored in tightly covered plastic containers for further analysis.

2.2 Modification of Adsorbents: 30g of powder was weighed into a beaker, 50ml of 0.5M Sulfuric acid (H_2SO_4) solution then added and left in an oven for 24hrs. The mixture was washed with de-ionized water and filtered. The samples were oven dried for 5hrs at 110 $^\circ\text{C}$, cooled and stored in a tight container for further analysis. The samples were labeled as Modified Mangrove Bark (MoMB) and Modified Mangrove Root (MoMR) sorbents. The untreated samples were labeled as Raw Mangrove Bark (RaMB) and Raw Mangrove Root (RaMR) sorbents.

2.3 Analysis of Adsorbent Surface Morphology: The morphology of the acid-modified and raw mangrove bark and root sorbents were analyzed using Phenom world SEM-Pro (model X800-07334) Scanning Electron Microscope (SEM) at the Multi User Laboratory, Umaru Musa Yaradua University, Kastina, Kastina State, Nigeria.

2.4 Preparation of Hexavalent Chromium Ion Solution (Adsorbate): Stock solution (1000ppm) of hexavalent chromium

was prepared by dissolving 2.828g of Potassium dichromate ($K_2Cr_2O_7$) in 1 liter of deionized water. Working solutions (10ppm, 20ppm, 40ppm, 60ppm, 100ppm) were prepared from stock solution by dilutions from the stock.

2.5 Batch Adsorption Studies: Experimental procedures adopted were similar to that by Nduka *et al.* [7]. Hexavalent chromium solutions and mangrove samples were equilibrated in 75ml beakers using Stuart orbital shaker at a constant speed of 150rpm. Samples were withdrawn at predetermined time intervals and filtered using Whatman No. 1 filter paper. Adjustment of pH was actualized by adding drops of either HCl (0.1M) or NaOH (0.1M) solution to the mixture. Filtrates were analyzed for residual hexavalent chromium concentration using Agilent MP-AES 42100 atomic absorption spectrophotometer (AAS). All pH measurements were made using pocket-sized pH Meter (HANNA instrument: H196107 pH) and the amount of hexavalent chromium ion adsorbed (q_e) was calculated using equation 1.

$$q_e = \left(\frac{C_o - C_f}{m} \right) \times V \quad (1)$$

where q_e is the amount of hexavalent chromium ion adsorbed (mg/g), C_o is the initial concentration of chromium (mg/l), C_f is the final hexavalent chromium ion concentration after treatment (mg/l), V is the volume of solution (l) and m is the mass of the adsorbent (g).

For pH effect, 0.5g of adsorbent of particle size 500 μ m was weighed separately and added to two different beakers containing 20ml of 40ppm hexavalent chromium ion solutions. The pH of the mixture was adjusted to 2. The mixture was covered and equilibrated using orbital shaker at the speed of 150rpm for 1hour. The mixture was filtered and the residual hexavalent chromium ion concentration determined using AAS. The procedure was repeated at various pH (4.0, 5.0, 8.0 and 9.0) for the modified (MoMB and MoMR) and raw (RaMB and RaMR) sorbents. For dosage effect, 0.25g mangrove sample (particle size = 500 μ m) was weighed into a beaker containing 20ml of 100ppm hexavalent chromium ion solution. The pH of the mixture was adjusted to 2. The solution was equilibrated at a constant speed of 150rpm for 60mins. The procedure was repeated for other dosages (0.5, 1.0, 1.5, and 2.0g) for both modified and raw mangrove bark and root. Similarly, 20ml solutions and 0.5g of various particle sizes (150, 500, 1000, 1200 and 2000 μ m) of both the modified and raw mangrove bark and root sorbents were used to study the effect of particle size. The mixture was filtered as in previous cases and the concentration of residual hexavalent chromium ion measured using AAS. The effect of hexavalent chromium ion concentration was investigated by equilibrating 0.2g of mangrove sample (particle size 500 μ m) in 20ml of 10ppm hexavalent chromium solution at pH 2. The procedure was repeated using 20, 40, 60 and 100ppm hexavalent chromium solutions for both modified and raw mangrove bark and root sorbents at same pH. For contact time, 0.2g of adsorbent material of particle size 500 μ m was weighed and equilibrated with 20ml of 60ppm hexavalent chromium solution at

pH of 2 for 30 minutes. The procedure was repeated for 60, 90, 120, 150, 180, 210 and 240 minutes equilibration times.

2.6 Adsorption Isotherms: Adsorption isotherm data were generated using 0.2g of the 500 μ m particle size and by varying the concentration of hexavalent chromium ion between 10 and 100ppm at solution pH of 2. Other experimental procedures were followed and the isotherm properties evaluated using Langmuir and Freundlich adsorption isotherms; equations 2 and 3 respectively.

$$\frac{C_e}{q_e} = \frac{K_l}{q_{max}} + \frac{1}{q_{max}} C_e \quad (2)$$

$$\log q_e = \log K_f + \frac{1}{n} \log C_e \quad (3)$$

In equations 2 and 3, q_{max} represents the maximum adsorption (mg/g) at monolayer, C_e is the equilibrium concentration of the metal ion in solution, q_e is the amount of ion adsorbed per unit weight of the adsorbent, K_l is the Langmuir constant related to the affinity of binding sites for the metal ion, K_f and n are called Freundlich constants. K_f defines the relative adsorption capacity while n indicates the intensity of the adsorption.

2.7 Adsorption Kinetics: To investigate the kinetic properties of the adsorption process, 0.2g of the adsorbent (particle size = 500 μ m) was added to 20ml of 60ppm hexavalent chromium ion solution and agitated at intervals of 30, 60, 90, 120, 150, 180, 210 and 240mins. Other experimental procedures were followed and the kinetic properties computed using equations 4 and 5 of pseudo-first and second order reactions respectively.

$$\log(q_e - q_t) = \log q_e - \left(\frac{K_1}{2.303} \right) t \quad (4)$$

$$\frac{t}{q_t} = \frac{1}{K_2 q_e^2} + \frac{1}{q_e} t \quad (5)$$

where q_e and q_t represent the amount of chromium (vi) adsorbed at equilibrium and at a given time, t . K_1 and K_2 are the rate constants of the pseudo-first order and pseudo-second order adsorption processes, respectively.

All the experiments were carried out at ambient room temperatures which ranged between 29.5 and 30.5 $^{\circ}$ C throughout the experimental period.

III. RESULTS AND DISCUSSION

3.1 Adsorbents Surface Morphology: SEM micrographs of 200 μ m modified (MoMB and MoMR) and raw (RaMB and RaMR) mangrove sorbents are presented in figure 1. It appears that the surface morphologies of MoMB and MoMR have similar structures with tiny openings while those of RaMB and RaMR are more porous. These observations suggest that the acid-modified sorbents had more adsorptive sites than the raw sorbents.

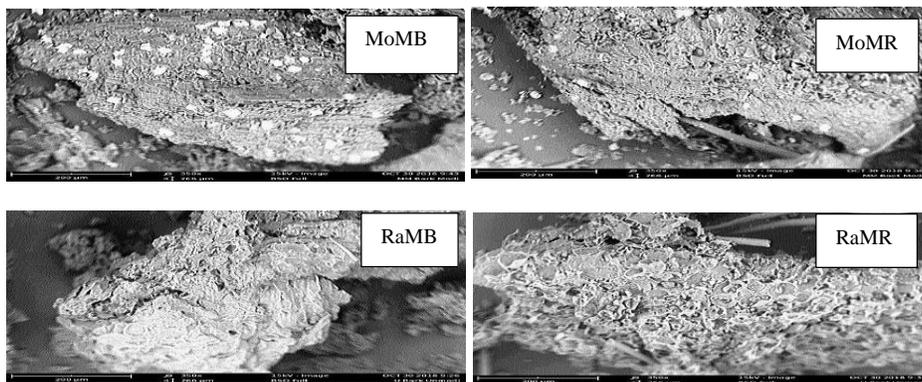


Figure 1: SEM Images of MoMB, MoMR, RaMB and RaMR

3.2pH: The adsorption capacities of modified and raw mangrove sorbents on hexavalent chromium ion as function pH are illustrated in Figure 2. The plots show that the adsorption capacities of the modified mangrove bark and root were greater than those of unmodified and both decreased with increasing pH of the solution. Similar observations have been made on modified and unmodified mangrove leaf sorbents by Nduka *et al.* [7]. Ortiz *et al.* [9] also observed a decrease in chromium (VI) ion adsorption with increasing pH using acid-modified corn biomass as adsorbent. This suggest that at low pH the surface of the adsorbents became positively charged by protonation with hydrogen ions which probably promoted the binding of negatively charged hexavalent chromium ion on the surface of the adsorbent. At high pH, adsorption became low apparently due to repulsion as adsorbent surface became more negative.

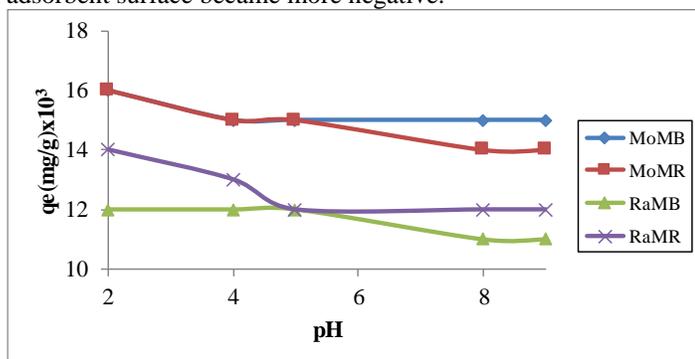


Figure 2: Plots of Equilibrium Adsorption Capacity (mg/g) as a Function of Solution pH.

3.3 Adsorbent Dosage: Plots of adsorption capacity against adsorbent dosage for MoMB, MoMR, RaMB and RaMR are illustrated in Figure 3. The results indicate an inverse relationship between adsorption capacities and the adsorbent doze. The results in Figure 3 describe a negative dependence of adsorption capacity on adsorbent dosage. However, modified sorbents exhibited higher adsorption capacity than the raw ones. The observed results suggest that increasing adsorbent dose increased adsorption binding sites without equivalent adsorbate to fill up the available

sites. Thus, the amount of adsorbate per unit adsorbent was reduced.

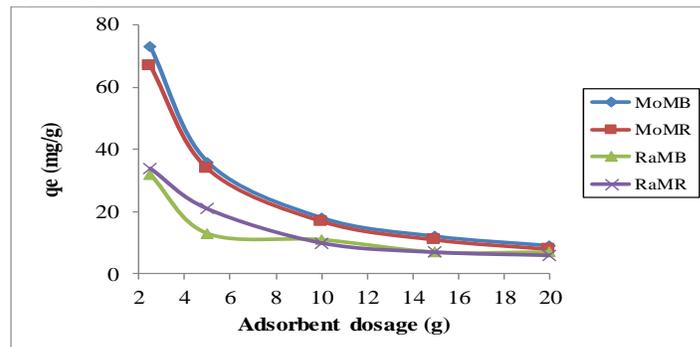


Figure 3: Plot of Equilibrium Capacity versus Adsorbent Dosage for the Adsorption of Hexavalent Chromium (VI) ion from Aqueous Solution using Modified and Raw Mangrove Sorbents.

3.4 Particle Size: The results of the effect of particle size on the adsorption of hexavalent chromium ion are displayed in Figure 4. The results describe an inverse relationship between adsorption capacity and adsorbent size. The observed decrease could be attributed to the fact that smaller particles have more surface area than the larger ones. Therefore, it can be inferred that the smaller the particle size, the larger the surface area and the more it tends to have higher adsorption capacity at a shorter equilibrium time.

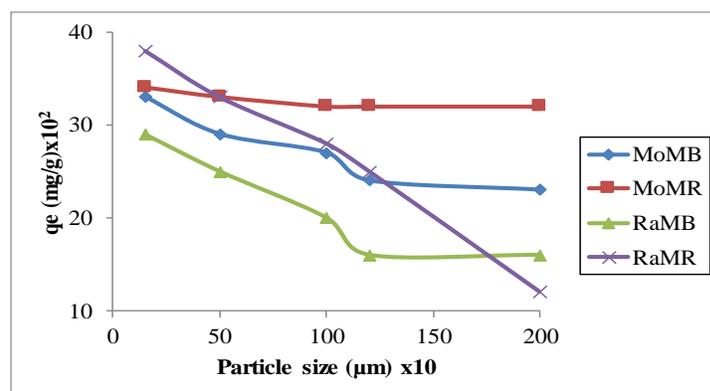


Figure 4: Plot of the amount of adsorbate (mg/g) against Particle Size (μm) for the Adsorption of Hexavalent Chromium (VI) ion from Aqueous Solution using Modified and Raw Mangrove Sorbents.

3.5 Hexavalent Chromium ion Concentration: Plots of adsorption capacity against hexavalent chromium ion concentration for MoMB, MoMR, RaMB and RaMR are presented in Figure 5. It describes positive dependence of adsorption capacity on concentration of hexavalent chromium ion. Similar observation was made by Olayinka *et al.* [10] on the adsorption of chromium (VI) from aqueous solution using adsorbents prepared from modified and unmodified coconut husk. The increase is possibly due to the fact that at higher concentration the active sites of the adsorbent would be surrounded with more hexavalent chromium ion, thereby enhancing the adsorption process. It is also observed in Figure 5 that modified sorbents exhibited higher adsorption capacity than the raw ones possibly due to their porous and wider surface feasibility.

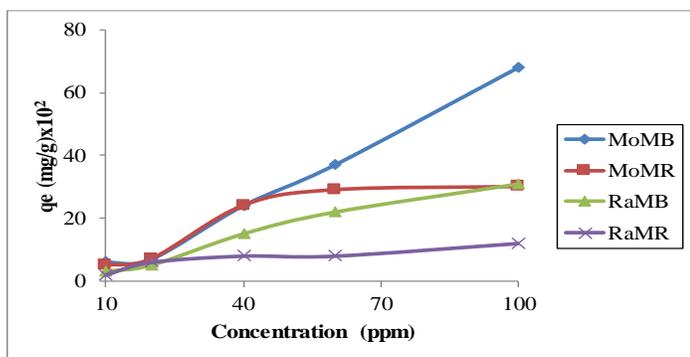


Figure 5: Plot of the amount of adsorbate (mg/g) versus Concentration of Adsorbate (ppm) Solution for the Adsorption of Hexavalent Chromium using Modified and Raw Mangrove Sorbents.

3.6 Contact Time: Adsorption capacities of MoMB, MoMR, RaMB and RaMR plotted as a function of contact time are displayed in Figure 6. The Figure shows that the capacity increased with increase in contact time but remained constant in all the adsorbents. Nduka *et al.* [7] made similar observation with mangrove leaf sorbent and attributed this behaviour to the availability of vacant binding sites on the adsorbents surface and long exposure time.

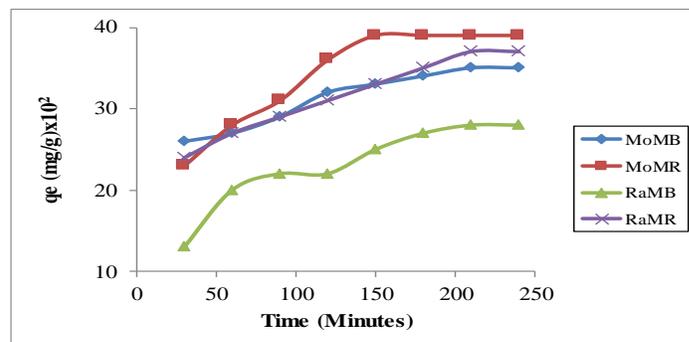


Figure 6: Plot of amount of Hexavalent Chromium Ion (mg/g) versus Contact Time (Minutes) for Modified and Raw Mangrove Sorbents.

Table 1: Isotherm Parameters for the Adsorption of Hexavalent Chromium Ion on Modified and raw Mangrove Sorbents

Adsorbent	Langmuir			Freundlich		
	Q_{\max} (mg/g)	K_l (l/mg)	R^2	K_f (mg/g)	n	R^2
MoMB	-3.3333	-41.33	0.807	32.92	1.00	0.993
MoMR	1111.1	145.56	0.110	122.15	1.18	0.806
RaMB	-3.3333	-89.67	0.740	9.5017	0.76	0.978
RaMR	2500.0	76.50	0.307	18.4884	0.66	0.887

Table 2: Kinetic Parameters for the Adsorption of Hexavalent Chromium Ion on Modified and raw Mangrove Sorbents

Adsorbent	Pseudo-first Order			Pseudo-second Order		
	q_e (mg/g)	K_1 (min ⁻¹)	R^2	q_e (mg/g)	K_2 (g/mg/min)	R^2
MoMB	1666.40	3.45×10^{-2}	0.898	3333	1.525×10^{-5}	0.996
MoMR	1500.34	3.89×10^{-2}	0.910	5000	5.333×10^{-6}	0.994
RaMB	1343.74	3.57×10^{-2}	0.782	3333	6.250×10^{-6}	0.994

RaMR	1511.80	3.55×10^{-2}	0.733	5000	4.819×10^{-6}	0.993
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3.7 Isotherm and Kinetic Parameters: The validity of primary adsorption data as well as the significance of secondary data evaluated therefrom usually depends on best-fit correlation coefficient (R^2) values of regression plots. Langmuir and Freundlich adsorption parameters for the adsorption of hexavalent chromium ion from aqueous solution using MoMB, MoMR, RaMB and RaMR sorbents evaluated from isotherm plots (figures not given) are presented in Table 1. Correlation coefficient values ($R^2 \geq 0.81$) obtained with Freundlich isotherm indicate good linearity. However, the low correlation coefficient values ($R^2 \leq 0.81$) from Langmuir plots indicate non-conformity with the isotherm. It has been reported [7, 11] that favourable adsorption occurs when Freundlich parameter $n \leq 10$. The values of K_f and n indicate favourable and good adsorption capacity of the adsorbent for hexavalent chromium ion. However, higher values of these parameters for modified bark and root suggest that the adsorption of hexavalent chromium ion was more feasible on modified than raw adsorbent.

Table 2 shows the pseudo-first order and pseudo-second order kinetic parameters of MoMB, MoMR, RaMB and RaMR sorbents. Considering the perfect linearity ($R^2 > 0.91$) and the pseudo-second order kinetic rate constants of 1.525×10^{-5} , 5.333×10^{-6} , 6.250×10^{-6} and 4.819×10^{-6} g/mg/min computed for MoMB, MoMR, RaMB and RaMR, the results (Table 2) suggest that chemisorption was the rate determining step in the adsorption of hexavalent chromium ion. Pseudo-first order rate constants (3.45×10^{-2} , 3.89×10^{-2} , 3.57×10^{-2} and $3.55 \times 10^{-2} \text{ min}^{-1}$) computed for the adsorption process were relatively high. However, for MoMB and MoMR, both physisorption and chemisorption could be suggested considering the high R^2 values of 0.898 and 0.996 then 0.910 and 0.994 recorded in both pseudo -first order and -second order kinetics. Hence, modified MoMB and MoMR were better adsorbents than the raw RaMB and RaMR.

IV. CONCLUSION

The effectiveness of acid-modified and raw mangrove bark and root as adsorbents for hexavalent chromium ion in aqueous solution was studied as function of pH, adsorbent dose, particle size, hexavalent chromium ion concentration and contact time. It was found that modified mangrove adsorbents are more effective in adsorbing hexavalent chromium ion than the raw (unmodified) mangrove sorbents. It was also found that the effectiveness decreased with pH, particle size and adsorbent dose but increased with hexavalent chromium ion concentration and contact time. The isotherm data obtained fitted Freundlich model, implying heterogeneous surface coverage. Kinetic data suggests both physisorption and chemisorption for MoMB and MoMR. This study reveals that the acid-modified mangrove bark and root extracts are better adsorbents for the adsorption of hexavalent chromium ion than raw mangrove bark and root extracts. The investigations clearly indicate that acid-modified mangrove can be used as adsorbent for treatment of water containing hexavalent chromium ion.

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The Association of Fibroblast Growth Factor-2 (FGF-2) Expression with Benign, Borderline, and Malignant Phyllodes Tumours of the Breast

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Abstract- Phyllodes tumours is a rare biphasic tumours, this is composed of neoplastic stromal cells and evolution containing epithelium. The stromal tumour is more cellular and increased. Phyllodes tumours are far less common than fibroadenoma and de novo arising, and not from previous fibroadenoma tumours. The bad changes are the feared malignant are increased stromal cellularity, anaplasia, high mitotic activity, rapidly increasing tumour size, and infiltrative edges. The incidence of phyllodes is <1% of all breast neoplasm in 0,1-0,5%, with the most incidence occurring at the age of 30- 40 years old.

Objective: This study was aimed to analyze the association of Fibroblast Growth Factor-2(FGF-2) with benign, borderline, and malignant phyllodes tumours of the breast.

Methods: This is an observational analytic study with cross sectional approach, involving 35 paraffin block samples from phyllodes tumours. In this study we found FGF-2 expression in 35 samples, consist of 15 samples of benign phyllodes tumours, 8 sample of borderline tumours, and 12 samples of malignant phyllodes tumours. The specimen of this study were embedded in paraffin and each section was cut from each block. Then FGF-2 staining were done. The positivity for FGF-2 were scored by using the following parameters. FGF-2 counts among 3 groups of cases were analyzed using statistic software.

Result: There were association between FGF-2 expression with benign, borderline, and malignant phyllodes tumours.

Conclusion: The FGF-2 expression in malignant phyllodes tumours has the highest mean value, followed by borderline phyllodes tumours, and benign phyllodes tumours have the lowest FGF-2 expression values.

Index Term: FGF-2, Phyllodes Tumours.

I. INTRODUCTION

Phyllodes tumours is a rare biphasic tumours of the breast. The incidence of phyllodes tumours account for 0,3-0,9% of all primary tumours of the breast.¹ Phyllodes tumours is biphasic neoplasm originally named cystosarcoma phyllodes by Johannes Muler in 1838, a term that is to be avoided because of its malignant connotations. Phyllodes tumours commonly occurs in middle-aged and older woman. Very few patients are younger than 25 years age, which is in striking contrast with the age

distribution of fibroadenoma tumours. However, phyllodes tumours can certainly occur in young adults and even in adolescents, and therefore, the diagnosis can't be excluded on the basis of age.¹⁻³ Phyllodes tumours increased in Asian countries, in Singapore this tumours occurred 6,92% of all malignancies in the breast and occur at a younger ages, 25-30 years old. Although rarely found, there have been reports of this tumours in men. The frequency of these tumours, based on changes in histopathological features (gradations) is 75% benign, 16% borderline, and 9% malignant. Although it has been reported, there is rarely a synchronous or metachronous presence in this tumours.^{4,7} It also difficult to diagnose phyllodes tumours because of subclassification resembling fibroadenomas. The prognostic value of immunohistochemical markers of tumour growth, angiogenesis, and malignant transformation has been confirmed in many tumours, including breast carcinoma. Studies have shown significant differences in FGF-2 expression for benign and malignant phyllodes tumours of the breast.⁹ FGF-2 is a very potent stimulator for proliferation, migration of endothelial cells, and tube formation in vitro and also high angiogenic in a number of tissues in vivo.¹⁰ The existence of FGF can be obtained by two methods, namely: first by conducting immunohistochemical examination of tumour tissue and by examining the Enzyme-Linked Immunosorbent Assay (ELISA) of blood serum, then FGF levels will be obtained. From this examination will be obtained a response from the FGF receptor. Increases in both FGF and FGF receptors have important significance in tumour growth.¹¹ In a previous study, Dacic et al., only examined the expression of FGF-2 in benign and malignant phyllodes breast tumours, and did not evaluate it in phyllodes borderline breast tumours.⁹ In addition, there is still very little research that addresses the problems mentioned above, causing the existing data is also limited. In Indonesia, especially in North Sumatera, there are no studies that analyze the appearance of expression and its relationship with phyllodes tumours.

II. MATERIAL AND METHODS

This is an observational analytic study, using a cross sectional approach. This study was conducted at the Department of Anatomical Pathology Faculty of Medicine Universitas Sumatera Utara, Department of Anatomical Pathology in H. Adam Malik

Medan General Hospital, and Department of Anatomical Pathology in Pirngadi Medan Hospital. The research was held from July 2019 until November 2019, after approved by the Universitas Sumatera Utara and H. Adam Malik General Hospital Health Research Ethics Committee. All samples were obtained through surgical procedure. Inclusion criteria were phyllodes cases with adequate clinical data, available and undamaged formalin-fixed paraffin embedded tissue block with sufficient tumor tissue. Detailed clinical data were obtained from medical records or pathology archives consisting of age, sex, and size of the tumor. Histological type were determined independently by researchers through hematoxylin and eosin stained slides examination.

Histochemistry protocol and interpretation

The tissue sections were deparaffinized and rehydrated before pretreatment. Endogenous peroxidase was blocked with hydrogen peroxide followed by antigen retrieval. FGF-2 (GTX84502, GeneTex, California, America) mouse monoclonal antibodies was used as primary antibody. Diagnostic BioSystems (Diagnostic BioSystems, Pleasanton, CA, USA) polymer kit was used for detection. The reaction was visualized with diaminobenzidine and counterstained with Mayer’s hematoxylin followed by dehydration, clearing, and mounting. Positive control was colon. Expressions of FGF-2 were determined independently by researchers. The expression in cytoplasm was analyzed. FGF-2 expressions were determined independently by researchers. Nuclear and cytoplasmic positivity for FGF-2 by using the following parameters: 0 (no staining) 1+ (1-35% positive cells), 2+ (35-70% positive cells), and 3+ (70-100% positive cells).⁹

Statistical analysis

Statistical analysis was performed using SPSS software package version 22.0 (SPSS Inc., Chicago) with 95% confidence interval and Microsoft Excel 2010. Categorical variables were presented in frequency and percentage. Saphiro-Wilk test was applied to find out the normality continue data. The association between FGF-2 expression with benign, borderline, and malignant phyllodes tumours is assessed by Kruskal-Wallis, and continue with post hoc Dunn test to assessed the differences between the groups. The p-values < 0.05 were considered significant.

III. RESULT

Patients’ characteristics

The mean age for phyllodes tumour patients was 43.2 (±14.3) years. The most common in 12-63 years age group, 34 patients (97.1%) were females, only 1 patients (2.9%) were males. The mean size of tumours was 21.85 cm which is 6-25 cm for benign phyllodes, 12-15 cm for borderline phyllodes, and 15-35 cm for malignant phyllodes tumours. The number of the patients benign phyllodes was 15 (42.9%), borderline phyllodes was 8 (22.9%), and malignant phyllodes was 12 (34.2%). The histological subtypes of benign phyllodes was the majority of this case. Clinical basic characteristic of phyllodes patients were summarized in table 1. Representative H&E sections are shown in figure 1.

Table 1. Characteristic of phyllodes patients

Age, mean ± SD, years	43.2 ± 14.3	
Benign 12-63		
Borderline 20-65		
Malignant 17-74		
Tumours size, mean, cm	21.85	
Benign 6-25		
Borderline 12-15		
Malignant 15-35		
Characteristic	N	Percentages(%)
Dagnosis		
Benign phyllodes	15	42.9
Borderline phyllodes	8	22.9
Malignant phyllodes	12	34.2
FGF-2 expression: n (%)		
Mild	10	28.6
Moderate	14	40.0
Strong	11	31.4
TOTAL	35	100

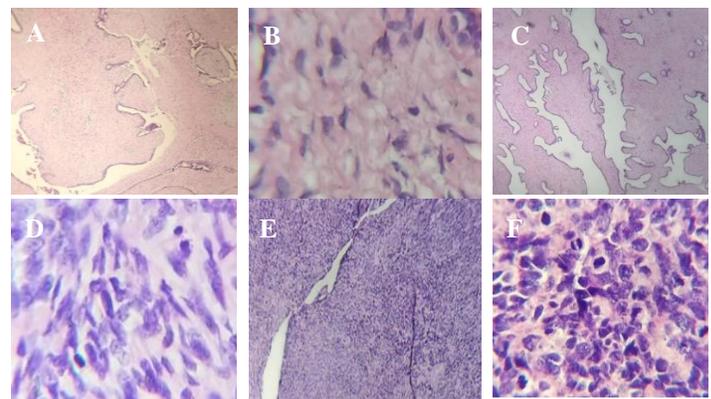
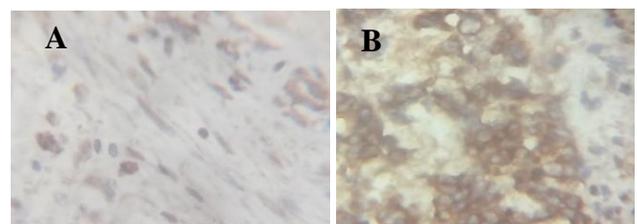


Figure 1. Histological type. A, Benign phyllodes (HE, 40x). B, Benign phyllodes (HE, 400x). C, Borderline phyllodes (HE, 40x). D, Borderline phyllodes (HE, 400x). E, Malignant phyllodes (HE, 40x). F, Malignant phyllodes (HE, 400x).

FGF-2 expression

The intensity of FGF-2 expression in nuclear and cytoplasm are shown in figure 2.



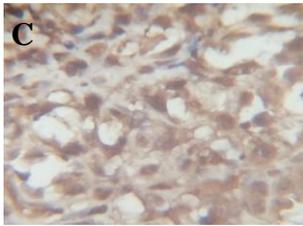


Figure 2. Immunohistochemistry FGF-2 expression. A, Mild intensity B, Moderate intensity. C. Strong intensity.

Association between FGF-2 expression in benign, borderline, and malignant phyllodes tumours

The number of cases for positive FGF-2 expression was found more in malignant phyllodes tumour. In this study, a statistical test was performed to determined the relationship between FGF-2 expression and benign, borderline, and malignant phyllodes breast tumours, the a statistical test was performed to determined it.

Tabel 2. Association between FGF-2 expression in benign, borderline, and malignan phyllodes tumours

Diagnosis	FGF-2 expression						p-value*
	Mild		Moderate		Strong		
	n	%	n	%	n	%	
Benign	9	60.0	5	33.3	1	6.7	0.0008
Borderline	0	0	6	75.0	2	25.0	
Malignant	1	8.3	3	25.0	8	66.7	

*Kruskal-Wallis test

In this study, we found that the test p-value 0.0008 was obtained, it can be concluded that there is a relationship between FGF-2 expression and phyllodes tumours.

Table 3. The differences FGF-2 expressions between group lesions of benign, borderline, and malignant phyllodes tumours

The differences of FGF-2 expression	p-value*
Benign vs Borderline	0.012
Benign vs Malignant	0.0001
Borderline vs Malignant	0.169

There were differences in the FGF-2 values between groups of benign phyllodes tumour lesions with malignant phyllodes tumour lesions with $p < 0.001$, while between groups of benign tumour lesions with borderline lesion with malignant there are no differences in values with p-values of 0.012 and 0.169, respectively.

IV. DISCUSSION

The incidence of breast phyllodes tumours is very rare, with the most incidence occurring at the age of 30 to 40 years, even in one study reported phyllodes tumours occurred at an older age, ie 45-54 years. In a research, Tan et al. reported that phyllodes tumours were 6.92% of all malignancies in the breast and

occurred at a younger age of 25-30 years.¹ In some previous study found that phyllodes tumours occurs at a younger age of 19-66 years, with a mean \pm sd 40.11 ± 12.06 and a median of 38.9, according to the young age in the study conducted by Ben et al., with a mean of 39,5 (14-71) and Nurhayati's study with a mean of 42 (16-78).¹⁹ In this study the mean age of the sufferers was 43.2 ± 14.3 years with the youngest age is 12 years, and the oldest age is 74 years. And most occur at the age of 12-63 years.

Karim et al., reported that although it was rarely found, phyllodes tumours had been reported report in men.¹² This was in line with this study where of the 35 samples studied, there was only one male samples (2.9%), while 34 other samples were female (97.1%). The frequency of these tumour events based on changes in histopathological features is 75% benign, 16% borderline, and 9% malignant.¹² Tan et al., reported that the relative proportions of benign phyllodes tumours were 60-70%, borderline 15-20%, and malignant at 10-20%.¹ Xiaofang et al., in their study reported from 52 patients there were 64% benign phyllodes tumours 25% borderline phyllodes tumours, and 6% malignant phyllodes tumours.¹³ From this study we found 15 benign phyllodes tumours (42.9%), 8 borderline phyllodes tumours (22.9%), and 12 malignant phyllodes tuomors (34.2%). The FGF-2 expression in this study was found to be mild in 10 samples (28.6%), moderate expression in 14 samples (40%), and in strong expression there were 11 samples (31.4%).

Phyllodes tumours can be clearly seen if it rapidly enlarges. Rapid enlargement does not always indicates malignancy. Looks shiny with stretched skin surface accompanied by widening of the skin surface veins. In some cases that are nor handled properly, skin ulcers can occur due to tissue ischemia. Although proper skin changes in breast tumours always show signs of malignancy, but not phyllodes tumours, ulcer on the skin can occur in benign, borderline, or malignant lesions. Nipple retraction is not common. Ulceration indicates tissue necrosis due to large tumour suppression. Large size of tumours can also cause necrosis with bleeding.^{14,15,16} In one study it was reported that changes in clonality in stromal cells lead to benign phyllodes tumours and progression to monoclonal progression in epithelial and stromal cells in borderline and malignant.⁷ Approximately 10-40% of tumours of this type have a risk of local recurrence and spread systemically.⁵ This corroborates the results of the study why delay in handling from patients and tumour recurrence can cause the percentage of malignancy to increase. Research on 8.567 breast tumour patients in 1969-1993 only found 31 cases of phyllodes tumours (0.37%). Overall, 2.1 cases per million women, very rare in men. Most phyllodes tumour cases occur in the 4th decade, rarely in adolescents, can occur at any age. Tumours are usually benign but local recurrence can occur and sometimes can spread systematically; rarely bilateral (either synchronous or metachronous).²⁰⁻²² Several previous studies found that tumours to be less than 5 cm in size, therefore, the diagnosis cannot be made based solely on tumour size. Prolonged gaps (leaf-like appearance) in the across section are typical signs of phyllodes tumours.¹⁷ In this study, the average tumour size was 21.85 cm, with a range of 6-35 cm. In benign phyllodes tumours the tumour size ranges from 6-25 cm, borderline 12-15 cm, and malignant phyllodes tumours 15-35 cm. Calhoun et al., in their study found that the phyllodes tumour size ranged from 1-40 cm. This research indicate that most phyllodes tumours are

large, however, there are also small-sized phyllodes tumours. In a previous study conducted by Flynn et al., and Calhoun et al., it was reported that phyllodes tumours were generally large (>2-3 cm).^{15,16,18} This is suitable with the results of this study where it was found that phyllodes tumours size ranged from 6-35 cm.

This study used the WHO classification breast tumours involving 35 samples of phyllodes tumour consisting of 15 samples of benign phyllodes tumours, 8 samples of borderline phyllodes, and 12 samples for malignant phyllodes tumours.

In a research conducted by Parker, found that phyllodes tumour are more often in the upper lateral quadrant with the same tendency between the right and left breast.²³ In this study also found that of the 35 samples examined, there were 28 (80%) patients with tumour location in the upper lateral quadrant and 7 (20%) patients with tumour location in the lower lateral quadrant. It is not yet known exactly why the location of this phyllodes tumour is predominantly in the upper lateral quadrant, suggesting that it may be caused by more glands in the upper lateral quadrant of the breast.

In this study the authors performed FGF-2 staining on benign, borderline, and malignant phyllodes breast tumour sample with the aim of improving the accuracy of diagnosis so that management can be carried out appropriately. Dacic et al., in their study stated that of the 23 samples studied, there were 14 samples of benign phyllodes tumours and 9 samples of malignant phyllodes tumours. In that study it was stated that there were differences in the expression of FGF-2 between benign phyllodes breast tumour and malignant phyllodes tumours. FGF-2 expressions are more expressed in the stroma than in the epithelium in both benign and malignant phyllodes tumours.⁹ FGF-2 is expressed in benign breast tumours and malignant breast tumours. FGF-2 enhances tumour growth through the proliferation effect of tumour cells undergoing the degeneration of the surrounding matrix, or the formation of new blood vessels.^{9,24}

In their study, dacic et al., showed that FGF-2 is expressed in the cytoplasm in the stroma and epithelial components in most tumours. FGF-2 has also been detected in normal breast tissue (myoepithelial cells and extracellular perivascular matrix) and in malignant breast tumours. This shows that mitogenic polypeptide which stimulates plasminogen activator and has been detected in tumours that have invaded. It was further said that there was a significant correlation between FGF-2 expression and benign and malignant phyllodes breast tumours. In addition, FGF-2 is also involved in the regulation of angiogenesis and synthesis of various proteases.⁹

Granato et al., in their study stated that the percentage of FGF-2 immunopositive breast tumours varies greatly in different tumours, from negative to positive in all tumour areas. In the majority of cases (84%) were positively expressed in the cytoplasm, and only a small proportion (16%) were expressed in the cell nucleus and cytoplasm of tumour cells.²⁴ In line with the research conducted by Granato et al., in this study was found that the expression of FGF-2 in benign, borderline, and malignant phyllodes tumours varied in value, and performed in the cytoplasm and nucleus of tumour and stromal cells.

In this study, for FGF-2 expression, from the 15 benign phyllodes tumour samples, 9 (60%) samples were mild expressed, 5 (33.3%) samples were moderately expressed, and 1

(6,7%) sample was strongly expressed. For borderline phyllodes tumours, from 8 samples, there were no sample that were mildly expressed, 6 (75%) samples were moderately expressed, and 2 (25%) samples were strongly expressed. Whereas in malignant phyllodes tumours, from 12 samples, there were 1 (8.3%) samples that were mildly expressed, 3 (25%) samples were moderately expressed, and 8 (66.7%) samples were strongly expressed. From the results of this study it was also found that there were differences in values between the groups of benign phyllodes tumour lesions with malignant phyllodes with $p < 0.001$, while between groups of benign tumour lesions with borderline and groups of borderline lesions with malignant there were no differences in values of 0.012 and respectively 0.169.

V. CONCLUSION

For FGF-2 expression, from the 15 benign phyllodes tumour samples, 9 (60%) samples were mild expressed, 5 (33.3%) samples were moderately expressed, and 1 (6,7%) sample was strongly expressed. For borderline phyllodes tumours, from 8 samples, there were no sample that were mildly expressed, 6 (75%) samples were moderately expressed, and 2 (25%) samples were strongly expressed. Whereas in malignant phyllodes tumours, from 12 samples, there were 1 (8.3%) samples that were mildly expressed, 3 (25%) samples were moderately expressed, and 8 (66.7%) samples were strongly expressed.

COMPETING INTERESTS

The authors have no relevant financial interest in the products or companies described in this article.

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ETHICAL APPROVAL

Health Research Ethical Committee, University of Sumatera Utara, Medan, Indonesia approved this study.

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Correlation of Stromal Tumor-Infiltrating Lymphocytes (TILs) Degrees with Total Prostate Specific Antigen (PSA) in Benign Prostate Hyperplasia and Prostate Adenocarcinoma

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Abstract- Prostate disorders are one of the main causes of quality of life disorders in men. Since 1994, the total PSA value has been approved by the United States Food and Drug Administration (FDA) as a marker of early detection, determining the stage and prognosis in prostate cancer. Many studies have reported the benefits of tumor-infiltrating lymphocytes (TILs) in tumor cells, where TILs are effective in slowing tumor progression, although the mechanism is still the opposite. This study uses tissue samples of Benign Prostate Hyperplasia (BPH) and Prostate Adenocarcinoma (BPH) to assess the correlation between the degree of Stromal Tumor-Infiltrating Lymphocytes (TILs) with Total Prostate Specific Antigen (PSA) in Benign Prostate Hyperplasia (BPH) and Prostate Adenocarcinoma. A total of 32 histopathological slides for patients with BPH and prostate adenocarcinoma were examined to assess the degree of stromal TILs. Age characteristics and Total PSA values were obtained through medical records. The relationship of the degree of Stromal Tumor-Infiltrating Lymphocytes (TILs) with Total Prostate Specific Antigen (PSA) was analyzed using SPSS version 22. The results of the analysis showed that there was a significant correlation between the degree of Stromal Tumor-Infiltrating Lymphocytes (TILs) and Total Prostate Specific Antigen (PSA) on BPH and Prostate adenocarcinoma.

Index Terms- benign prostate hyperplasia, adenokarsinoma prostat, stromal TILs, total PSA.

I. INTRODUCTION

Prostate disorders are one of the main causes of quality of life disorders in men throughout the world. This disease ranks second most often appears in men after respiratory disorders. The most common prostate disorders are benign prostate enlargement and prostate cancer. Benign prostate hyperplasia (BPH) or benign prostate enlargement is the most common type of tumor and occurs in about 70% of men over the age of 60 years. Worldwide, around 30 million men had symptoms related to BPH in 2013. At Cipto Mangunkusumo Hospital in Jakarta, from 1994-2013, 3804 cases were found with an average age of sufferers of 66.61 years. At Adam Malik Hospital in Medan during 2015-2016, there were 23 cases diagnosed with BPH with

an average age of 65.61 years.¹ Prostate cancer currently ranks second in malignancies in men and often appears asymptomatic. From the data of the Indonesian Society of Urologic Oncology (ISUO) 2011, there were 971 prostate cancer patients in Indonesia from 2006 - 2010, where the most cases were prostate adenocarcinoma with stage 4 (50.5%).^{2,3} In 2015- 2016 found as many as 39 cases diagnosed as prostate adenocarcinoma in Adam Malik Hospital Medan.

Since 1994, the total PSA value has been approved by the United States Food and Drug Administration (FDA) as a marker for early detection, to determine the stage and prognosis in prostate cancer. The PSA screening application has succeeded in reducing mortality. Most prostate cancers occur at stage T1c with a PSA level between 2.5 ng / mL to 10 ng / mL.⁴⁻⁶ In the United States the 5-year survival rate in prostate cancer diagnosed at an early and regional stage is near 100%.^{4,7,8} Over the past 20 years, although not yet absolutely proven, PSA examination has significantly reduced mortality and metastatic events.^{3,4} The role of the immune system in regulating the level of malignancy has increased significantly.^{9,10} Many studies have reported the benefits of Tumor-Infiltrating Lymphocytes (TILs) in tumor cells, where TILs are effective at slowing tumor progression, although the mechanism is still contradictory. Histopathological measurement of TILs was performed to see an increase in immunological reactions to tumors, where an increase in prognosis in various types of cancer can affect the stage and grading of the tumor.¹¹

II. MATERIAL AND METHODS

Sample selection

This study was selected cross-sectionally at H. Adam Malik General Hospital Medan consisting of 15 cases of BPH and 17 cases of prostate adenocarcinoma, which aims to assess whether there is a correlation between the stromal degree of TILs with the total PSA in BPH and prostate adenocarcinoma. All samples were obtained through TUR-P. Inclusion criteria were slides diagnosed with BPH and prostatic adenocarcinoma by histopathology and total PSA value data obtained from medical records. The assessment of TILs was carried out independently

by the researchers through examination of hematoxylin-eosin slides.

Prostate-Specific Antigen (PSA)

Prostate-Specific Antigen (PSA) is a protein produced by prostate cells to regulate the viscosity of semen. This protein is produced in large quantities by prostate cells and this test is used as prostate neoplasm screening. Total PSA value, categorized as:

1. Normal = PSA value ≤ 4,0 ng/ml
2. Medium = PSA value 4,1-10 ng/ml
3. High = PSA value > 10 ng/ml.¹²

Stromal Tumor-Infiltrating Lymphocytes (TILs)

Stromal Tumor-Infiltrating Lymphocytes (TILs) are defined as mononuclear inflammatory cells that are in the stromal tissue between the nests of cancer cells, and are not directly related to cancer cells. TILs are assessed at 400x magnification, and assess the percentage of stromal area alone without including calculations in tumor cells. For example, a score of 50% stromal TILs means that 50% of the surface area of the stroma and not 50% of the stroma plus epithelial cell area. The assessment is based on the focus of the most dense lymphocyte infiltration, divided by TILs working group 2013:

1. Mild : 0-10 % stromal TILs (HPFs 400x)
2. Moderate : 11-49 % stromal TILs (HPFs 400x)
3. Severe : ≥ 50 % stromal TILs (HPFs 400x).¹³

Grading

Histopathological grading of prostate adenocarcinoma is a scale for determining the prognosis of a prostate adenocarcinoma seen based on histopathological assessment based on the Gleason scale (WHO, 2016) which is categorized as:

1. Grade group 1, Gleason score ≤ 6 : consists of a combination of glands with well differentiation.
2. Grade group 2, Gleason score 3+4=7: More well differentiation glands, followed by fusion of glands.
3. Grade group 3, Gleason score 4+3=7: More fusion/ciribriform glands, followed well-differentiated glands.
4. Grade group 4, Gleason score 4+4=8, 3+5=8, 5+3=8: Consists of both poorly differentiation and fusion gland patterns, well differentiation followed by poorly differentiation gland, or more poorly differentiation glands followed by well differentiation.
5. Grade group 5, Gleason score 9-10: poorly differentiation gland forms with or without necrosis or both poorly / solid differentiation.⁴

Statistical analysis

Statistical analysis was performed using SPSS software version 22.0 (SPSS Inc., Chicago). To analyze data on the relationship of the stromal degree of TILs to the Total PSA on BPH and prostate adenocarcinoma researchers used the Spearman correlation test p-value> 0.05 was considered not significant.

III. RESULT

From 15 BPH samples and 17 prostate adenocarcinoma samples, there was no difference in age characteristics between BPH and

prostate adenocarcinoma, p-value = 0.899 (p> 0.05). There are differences in the characteristics of the Total PSA level between BPH and prostate adenocarcinoma, p-value = 0.002 (p <0.05). There was a difference in the percentage of stromal TILs between BPH and prostate adenocarcinoma, p-value = 0.0001 (p <0.05).

Table 1. Characteristics of the sample based on the type of lesion.

No	Characteristics	Benign Prostate Hyperplasia (n=15)			Prostate Adenocarcinoma (n=17)			P-value
		Median	Mean	SD	Median	Mean	SD	
1.	Age (year)	63	64,7	7,3	63	64,4	6,9	0,899*
2.	TotalPSA (ng/mL)	6,7	9,7	8,1	39	57,2	59,7	0,002**
3.	Percentage Stromal TILs	35	32,7	21,7	5	5,8	3,5	0,0001**

* T Independent test ** Mann-Whitney U Test

There was a significant correlation between degrees of stromal TILs and total PSA in 32 samples (BPH and prostate adenocarcinoma), p-value = 0.011 (p <0.05). Whereas in each sample, BPH (p-value = 0.225) and prostate adenocarcinoma (p-value = 0.355), did not show a significant relationship (p> 0.05).

Table 2. Correlation of degrees Stromal TILs and Total PSA.

No.	Lesion	Correlation coefficient (p)	P-value*
1.	BPH and Prostate Adenocarcinoma	-0,445	0,011
2.	BPH	0,333	0,225
3.	Prostate Adenocarcinoma	-0,239	0,355

* Correlation Spearman Test

There was no significant correlation between the degree of stromal TILs with Gleason score of prostate adenocarcinoma, p-value = 0.083 (p> 0.05). While the relationship of the total PSA value with the Gleason score in prostate adenocarcinoma obtained p-value = 0.006 (p <0.05), which shows a significant correlation.

Table 3. Correlation between stromal TILs and Total PSA with Gleason score of prostate adenocarcinoma.

No.	Variable	Correlation coefficient(p)	P-value*
1.	Stromal TILs Percentage	-0,398	0,083
2.	Value of Total PSA (ng/mL)	0,802	0,0001

* Correlation Spearman Test

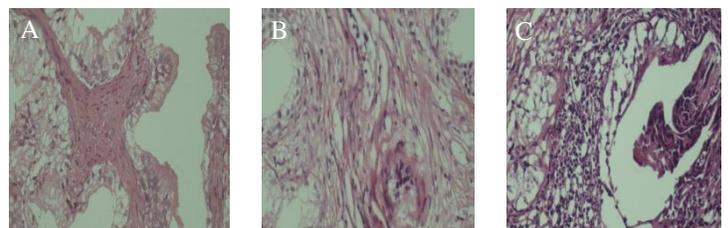


Figure. Infiltration degrees stromal TILs of BPH. A. Mild 0-10%, B. Moderate 11-49%, C. Severe > 50%.

IV. DISCUSSION

Inflammatory cells are commonly associated with neoplasms, where TILs play a role as a tumor cell defense factor, which often appears in solid tumors, including the prostate. The prostate is considered immunologically special because of the immunosuppressive properties of semen. Research on local immunosuppression of the prostate has been carried out on BPH, prostate intraepithelial neoplasia and prostate cancer.⁹ The role of the immune system in the prostate has increased recently, where the development of immunotherapy is used as a new paradigm.¹⁰

In this study, the mean age for BPH was 64.7 years and for prostate adenocarcinoma 64.4 years. The data obtained in this study are in accordance with previous studies by Andreas M I (2017), who found that almost 90% of sufferers were aged over 60 years, and two to thirds died over 75 years. The risk of being diagnosed with prostate carcinoma is very closely related to the age factor, where in men aged 70-79 years have almost 7 times higher risk than men aged 50-59 years and the risk of death also increases to 21 times higher.¹⁴ According to WHO the patient's age closely related to the incidence of prostate cancer, and most detected at age > 60 years. Only 1% of prostate cancer is detected when clinical examination aged <50 years.⁴

There are differences in the total PSA level between BPH and prostate adenocarcinoma, where the higher the total PSA level, the possibility of suspicion of the occurrence of a prostate malignancy will be even greater. This is consistent with the research of Prcic et al., Which obtained a Total PSA value statistically having a significant correlation between BPH and prostate cancer, where the Total PSA is very high in prostate cancer, and lower in BPH.¹⁵ Observation of PSA levels is moderate (4- 10 ng / ml), it is still difficult to predict as a possibility of prostate cancer, which often results in about 75% of negative biopsy results. Therefore, besides using Total PSA, it can also be compared by using free PSA measurement. Free PSA was reported to have a more significant proportion of BPH patients than prostate cancer ($p < 0.00001$).¹⁶

In this study, there were differences in the Total PSA is very high in prostate cancer, and lower in BPH Total PSA is very high in prostate cancer, and lower in BPH. The presence of T cells in BPH is induced by co-inhibitory receptors, co-stimulatory and regulatory T cells which cause epithelial cells and BPH stroma to produce cytokines and proinflammatory chemokines.¹¹ Whereas in prostate cancer the number of T cells decreases, and T cells that increase are memory T cells. Some findings reveal that the immunomodulatory effect of tumors affects the development of organs. Another thing that is also related is the interaction of T cell phenotypes with tumor cells.¹⁷ Several studies have determined the type of T cell subset that plays a role in BPH and prostate adenocarcinoma, for the continuity of treatment in the future.^{18,19}

There is a correlation between the stromal degree of TILs and the total PSA in BPH and adenocarcinoma, where an increase in the total PSA value is followed by a decrease in the degree of stromal TILs. There is no correlation between the degree of stromal TILs and total PSA in BPH (p -value = 0.225) and

prostate adenocarcinoma (p -value = 0.355). This is because the distribution of the total PSA value in each sample is not evenly distributed.

There is no significant correlation between the degree of stromal tumor-infiltrating lymphocytes (TILs) with Gleason score in prostate adenocarcinoma. This study is different from that obtained by Nardone et al., where they get TILs correlated with different grades and PSA values. Diagnostic index based on Gleason score can direct the diagnosis of prostate cancer.²⁰ There was a significant correlation between total PSA and Gleason score in prostate adenocarcinoma ($p = 0.0001$), where an increase in total PSA was followed by an increase in Gleason score. An increased total PSA value can indicate a positive tendency for cancer, high grade, and possibly bone metastasis.²¹ About 50% of cancer positive biopsy results have been obtained for a total PSA value of more than 20 ng / mL.²²

V. CONCLUSION

There is a correlation between the degree of stromal TILs and total PSA in BPH and prostate adenocarcinoma

COMPETING INTERESTS

The author has no financial interests relevant to the product or company described in this article.

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ETHICAL APPROVAL

Health Research Ethical Committee, University of Sumatera Utara, Medan, Indonesia approved this study.

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Effect of diluted Royal jelly on Semen quality, immunological and biochemical parameters in white rabbits

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Abstract

Background: Royal jelly was secreted from cephalic glands of nurse bees as product, this product has many activities on health especially the infertility effects. This study was design to determine the royal jell activity on rats males.

Materials and methods: - In this study the rats males were classified to four groups according to royal jell concentration that feed to them, one control and three case group. The case groups gavaged 100 ,200 300 mg/kg Royal jelly once a day, while the control group not give the Royal jelly. The feed was continuing for 30 days. The quality of semen, biochemical and immunological constituents were evaluated and performed on samples.

Results: - the sperm concentration, motility, live sperm give statistically significant difference according among study groups when camper with control group except the semen volume. The biochemical and immunological parameters (testosterone, IgG, IgM, IgA) give statically significant difference.

Conclusion: - The quality of semen parameters increased due to royal jelly consumption especially the sperm concentration and motility, RJ have characteristic that increase testosterone levels and give good immunity that lead to increase fertility in rat's males. These effects would be useful for infertile men who have low sperm count and weak sperm motility to help them for fertility.

Key words: -RJ, testosterone, Immunoglobulin

Introduction

Royal jelly (RJ) is jell like and a thick material, extremely nutritious, milky-white, creamy liquid secreted by the hypo pharyngeal and mandibular glands of the nurse bees .Royal jelly (RJ) was used for centuries for its extraordinary properties and health effects (Pavel *et al.*, 2011). There are different study funded the relation and effect of royal jelly on male fertility. Study on rabbits done by Elnagar (2010) concluded that administration of RJ to heat stressed male rabbit bucks can activated their "summer infertility" and increased their physiological status and also for growing rabbits (Elnagar *et al.*, 2010). RJ allows the complete development of the larvae in their brood cells and maintains its ovulatory capacity over its entire life-span [Märghitaş, L. A 2008]. This unusual property of RJ has spurred a possible connection to fertility and we know that RJ has always been used as a stimulator of fertility.

2. Material and methods

2.1. Subjects and study design

A total of 40 rabbit males were included in this study (10 males for each group).All of these rats feed with RJ .The RJ was given orally, using an insulin syringe directly in the oral cavity in a normal saline solution at 100, 200 and 300 mg/kg three every week until a 16-weeks .The 0 group receive only normal saline without RJ these consider as control group

Sample collection and assay procedure

The sample collection done after 4 weeks from beginning the experiment ,semen samples and the volume of ejaculate was recorded, the sperm concentration, total motile sperm, live and dead sperm was recorded by full automated sperm analyzer. The blood sample was collected from ear vein by using heparinized tubes, then the blood samples were centrifuged at 3000 rpm for 10 min to obtain plasma and stored at -20°C until the analysis. The testosterone and Immunoglobulin concentration were determined by using ELISA assay .

Statistical analysis:-

The result was analyzed by using the statistical software package SPSS 23. The probability of (P≤ 0.05) was considered in statistically significant.

Results and Discussion

The results of table one show the that the some semen quality parameters give significant results ,but the volume of ejaculation slightly increased by RJ feed and not give significant results, the explanation of the slightly increased may be due to increase in testosterone concentration due to RJ feed. RJ increase the spermatogenesis and that lead to increase sperm concentration and this agreed with Kohguchi et al., (2004) Kamel *et al.* (2009), .The sperm motility and sperm live also give a significant result according RJ concentration feed that associated with hydrogen ion in seminal plasma .

Table 1 :- Semen quality after royal jelly feed.

Parameter group	Royal jelly concentration (mg /kg)				P. value
	0	100	200	300	
Volume of ejaculation	0.70	0.721	0.740	0.742	P<0.2
Sperm concentration	450	530	554	570	P<0.05
Total motile sperm	170	252	254	280	P<0.05
Sperm motility	56.1	62.2	72.6	91.5	P<0.05
A live sperm	87.4	90.5	92.4	93.6	P<0.05
Dead sperm	12.6	9.5	7.6	6.4	P<0.05

In the table 2 the testosterone give statically significant difference among groups and this result agreed with Kohguchi *et al.* shown RJ diet excited higher testosterone content and better spermatogenesis in hamster testis (Kohguchi et al,2004).In another study performed on rabbits in Egypt by Elnagar, spermogram parameters were significantly improved and serum testosterone levels increased in heat stressed male rabbits after consumption of Royal Jelly(Elnagar SA,2012).the rats received RJ were significantly (P<0.05) increased the immunoglobulin IgG, IgM and IgA levels specially in heat-stressed rabbits .Like Elnagar *et al.* (2010) found that rate received RJ increased in IgG and IgM levels in heat-stressed growing rabbits. Yamada *et al.* (1990)and Hasan (2015) are found when give substances known to have Igs production stimulating factor activity like RJ and then examined on lymph node lymphocytes from breast cancer patients the IgM concentration was increased until 2 to 3 time. The IgM and IgG play role in pathogenesis of certain disease specially autoimmune disease like rheumatoid arthritis and royal jelly may reduce these effect Hasan (2015)

Table 2:-Biochemical and immunological parameters of semen.

Parameter group	Royal jelly concentration (mg /kg)				P. value
	0	100	200	300	
Testosterone(ng /ml)	0.501	0.611	0.742	0.781	P<0.05

IgM (mg/dl)	1.01	1.34	1.46	1.54	P<0.05
IgG(mg/dl)	2.99	3.23	4.72	5.31	P<0.05
IgA(mg/dl)	0.23	0.49	0.54	0.59	P<0.05
Lysozyme(mmol/ml)	90.3	81.1	71.3	60.5	P<0.05

Conclusion

The quality of semen parameters increased due to royal jelly consumption especially the sperm concentration and motility ,RJ have characteristic that increase testosterone levels and give good immunity that lead to increase fertility in rats males . These effects would be useful for infertile men who have low sperm count and weak sperm motility to help them for fertility.

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The Relationship between Clinicopathological Features of Invasive Breast Cancer Patients Based on IGF-1R Expression

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Abstract-Background: Breast cancer is the most common cancer found in women with approximately 23% cases of all cancer. It has been known that signaling through IGF-1R is involved in growth of many cancer especially breast cancer, for example by affecting cell proliferation, survival, invasion, and metastasis. One of the receptors in IGF pathway is IGF-1R. The research of IGF-1R expression and clinicopathological features in breast cancer patients is still controversial.

Objective: To analyze clinicopathological features of invasive breast cancer patients with IGF-1R expression.

Material and Method: This analytic study with cross-sectional study from 37 invasive breast cancer patients. Data about clinicopathological characterization were obtained from medical record. Then, re-cutting specimen paraffin blocks and immunohistochemical staining IGF-1R (Medasis company, rabbit monoclonal antibody, klon MD30R, dilution 1:50-100) were done. Results of analysis data were processed with statistical software and were presented in tables. Statistical test used in this research is chi-square or Fisher exact test.

Result: This study showed that there were significant relationship between menopausal status, body mass index, and histological grading with IGF-1R expression in invasive breast cancer patients (p value 0.044; 0.028; 0.002, respectively).

Conclusion: Immunohistochemistry of IGF-1R is needed in patients who is resistant to tamoxifen therapy.

Index Terms-: Invasive breast cancer, Clinicopathological features, Body mass index, Menopausal status, IGF-1R

I. INTRODUCTION

Breast cancer is the fourth most common cancer found in women with approximately 23% cases of all cancer.^{1,2} American Cancer Society concludes that the incidence of breast cancer is increasingly every year.³ Based on World Health Organization, it is estimated that the incidence of cancer in worldwide is projected to increase about 300 percents in 2030, and most of them will happen in developing countries including Indonesia.⁴

Insulin like growth factor (IGF) 1 is one of the IGF families that plays an important role in growth and development of many

tissues, especially mammary gland. There are two receptors in IGF pathway such as IGF receptor type 1 (IGF-1R) and IGF-2R. Both IGF-1 and IGF-2 show biological activity through IGF-1R signaling. It has been known that signaling through IGF-1R plays an important role in some cancer, especially breast cancer.⁵ IGF-1R expression has been associated with metastasis, drug resistance, radiotherapy resistance, and tumor recurrence.⁶

Obesity is a worldwide health issue and is well known risk factors for the development of certain cancer, including postmenopausal breast cancer.⁷ Molecular mechanism relating cancer and obesity is still unknown.⁸

Eventhough researches about IGF-1 in breast cancer patients indeed have long been established, the studies of IGF-1R and clinicopathological features of breast cancer patients are still controversial. Considering the conditions mentioned above, the authors were interested to study about the relationship between clinicopathological features of invasive breast cancer patients and IGF-1R expression. This study was aimed to assess the association of age, menopausal status, body mass index, histopathology subtype and grade histology with breast cancer.

II. MATERIAL AND PRODUCT

This analytic study with cross sectional approach was conducted at the Department of Anatomical Pathology Medical Faculty, Universitas Sumatera Utara, Medan. The research was held from August 2018 until November 2019, after approved by Health Research Ethics Committee of Universitas Sumatera Utara.

The samples were paraffin blocks from breast specimen histopathologically diagnosed with invasive breast carcinoma fulfilling inclusion and exclusion criteria. Samples were recruited using consecutive sampling technique. Inclusion criteria was full detailed medical record such as age, menopausal status, and body mass index. Exclusion criteria for this study were paraffin blocks that couldn't be processed and immunostaining, and at least 100 tumour cells were found in Hematoxylin Eosin (HE) staining. Each samples were stained with HE and IGF-1R immunohistochemistry (Medasis company, rabbit monoclonal antibody, clone MD30R, dilution 1:50).

IGF-1R expression was interpreted based on allred scoring system. The interpretation was done by adding percentage score of positive tumour cells and staining intensity. Percentage score of positive tumour cells were assessed as follows. Absent or present in $\leq 1\%$ positive in membrane/ cytoplasmic tumour cells was taken as score 1, 1-10% positive tumour cells was taken as 2, 11-33% was 3, 33-66% was 4, and 67-100% was 5. Meanwhile, staining intensity were scored as weak (score 1), moderate (score 2), or strong staining (score 3). After that, total addition were interpreted as negative (total score 0-2), low 1+ (total score 3-4), moderate 2+ (total score 5-6), and high 3+ (total score 7-8). Furthermore, IGF-1R expression was categorized as negative (negative and 1+) and positive (2+ and 3+).⁹ The data obtained in the research was processed with help of statistical software and presented in tables. Statistical test used in this study were chi-square or Fisher exact test.

III. RESULT

In this study, there were initially 50 breast tissue paraffin blocks histopathologically diagnosed as invasive breast carcinoma in Department of Anatomical Pathology, Medical Faculty, Universitas Sumatera Utara, Medan. From these 50 paraffin blocks, there were only 40 samples had full detailed medical record. From these 40 samples, only 37 paraffin blocks could be assessed.

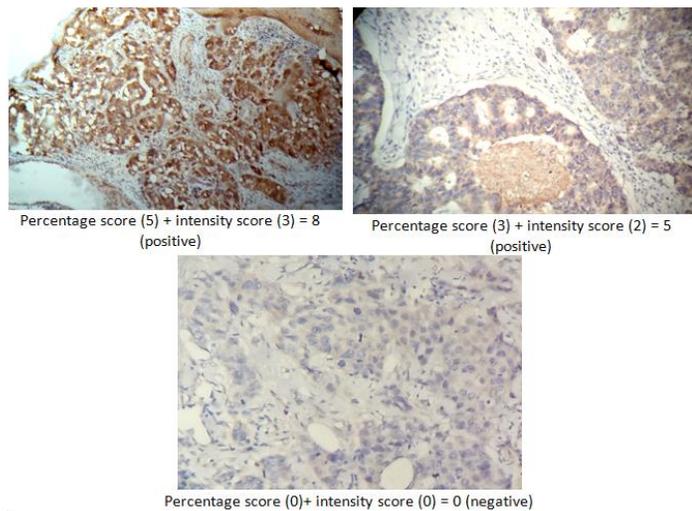


Figure 1. Interpretation of IGF-1R immunohistochemical staining.

In this study, analysis of association of age, menopausal status, body mass index, histopathological subtypes, and grading histology with breast carcinoma were done. Statistical test showed that there were significant relationship between menopausal status, body mass index, and grading histology with breast cancer (p value 0.044, 0.028, 0.002, respectively). Meanwhile, there were no significant association between age and histopathological subtypes with breast cancer (p value 0.823 and 1.000, respectively) (Table 1).

Furthermore, postmenopause invasive breast carcinoma patients had 3.048 higher risk to have positive IGF-1R expression than premenopause (95%CI 1.030-9.021).

Overweight patients had 0,294 risk than normal weight to have positive IGF-1R expression (95% CI 0.099-0.873). Last, patients with grade histology 3 had 4.706 risk than grade 2 to have positive IGF-1R (95% CI 1.586-13.961).

Variables	IGF-1R expression		Total	OR (95% CI)	p		
	Negative	%				Positive	%
Age (years old)							
- < 40	2	40	3	60	5	-	0.823
- 40 - 49	4	33.3	8	66.7	12		
- 50 - 59	7	50	7	50	14		
- ≥ 60	2	33.3	4	66.7	6		
Menopausal status						3.048	
- Premenopause	12	57.1	9	42.9	21	(95%CI:1.030-	
- Postmenopause	3	18.8	13	81.3	16	9.021)	0.044
Body mass index							
• 3groups							
- Normal	12	60	8	40	20	-	0.028
- overweight	0	0	2	100	2		
- obesity	3	20	12	80	15		
• 2 groups						0.294	
- Normal	12	60	8	40	20	(95%CI: 0.099-	0.023
- Over	3	17.6	14	82.4	17	0.873)	
Histopathology subtypes						0.884	
- ICNST	11	39.3	17	60.7	28	(95%CI:0.373 -	1.000
- Special type	4	44.4	5	55.6	9	2.096)	
Grading histology						4.706	
- Grade 2	12	70.6	5	29.4	17	(95%CI:1.586-	
- Grade 3	3	15	17	85	20	13.961)	0.002

Table 1. The relationship between clinicopathological features of invasive breast cancer patients with IGF-1R expression

IV. DISCUSSION

As mentioned before, IGF family plays an important role in development and dissemination of several types cancer, such as by influencing cell proliferation, cell survival, invasion, and metastasis.^{10,11} Bruchim, et al. (2013) reported that IGF-1R upregulation, in vitro and in vivo, had been correlated with certain types cancer, including breast.¹² IGF-1 could affect breast cells through 3 mechanisms as follows. First, endocrine mechanism which is from IGF-1 serum (especially produced by hepar and other tissues) can stimulate breast cancer cells. Second, paracrine mechanism leads to normal breast cells and adjacent stroma including fibroblasts, that can produce IGF-1 to e adjacent breast cancer cells. Third, autocrine mechanism which is by the tumour cells.¹³ This study showed that 22 samples out of 37 had positive IGF-1R expression (59.5%).

Bhardwaj et al. (2019) stated that in premenopause women, estrogen is mainly produced in ovarium. Hypothalamus releases gonadotropin releasing hormone (GnRH) that will stimulate the secretion of follicle stimulating hormone (FSH) and luteinizing hormone (LH). FSH stimulates biosynthesis of estrogen by developing ovarium follicles, that will induce LH production in hypothalamus. Acute LH surge will cause ovulation. After menopause, ovarium produce negligible amount of estrogen. The importance of steroidogenesis in gonad gland in the development of normal breast and origin of breast cancer is confirmed by facts stating that early menstruation and late menopause has been associated with higher risk of breast cancer. In postmenopause women, the one that plays a role as source of androgen to produce estrogen in the peripheral area is dehydroepiandrosterone sulfate (DHEA-S) from adrenal gland. Local biosynthesis of estrogen in breast and circulating serum level of estrogen, is believed as the representative of steroid

production derived from adipose tissue, that is directly associated with proliferation of breast tumour cells. This illustrates there is increased risk of breast cancer after menopause. In particular, breast expresses all enzymes needed to convert DHEA-S into estradiol (E2), including steroid sulfatase, 3 β -HSD, 17 β HSD1 and aromatase. Of all these enzymes, the one that the most important role in obesity is aromatase. Aromatase could be found in many tissues, such as breast, adipose, gonad, and etc. Its expression in breast adipose tissue is hypothesized as main driver causing breast cancer due to estrogen after menopause. After menopause, adipose tissue is the primary source of estrogen production in human body. The higher fat mass and higher body weight, the higher aromatase and estrogen level in postmenopausal women.¹⁴

Song et al. (2007) has revealed that 17 β -estradiol can activated IGF-1R activation pathway, that ultimately promote MAPK pathway.¹⁵ Overexpression and amplification of IGF-1R will activate PI3K/Akt/mTOR and Raf/Mek/Erk pathway and has proven to associated with continuous tumour proliferation apart from estrogen. This pathway gives an alternative stimulus to tumour, and can occur as tumour development driver without any connection with ER. This will cause resistance to therapy.¹⁴ Upregulation of IGF-1 pathway causes resistance breast cancer cell line to tamoxifen and fulvestrant through upregulation of MAPK and PI3K signaling.¹⁶

This study revealed that there were significant relationship between menopausal status, body mass index, and grading histology with IGF-1R expression in invasive breast cancer patients (p value= 0.044, 0.028, and 0.002). However, there were no significant association between age and histopathological subtypes with IGF-1R in invasive breast cancer patients (p value= 0.823 and 1.000). Studies about the relationship between IGF-1R expression and clinicopathological features of invasive breast cancer patients to date is still controversial. Some literature showed there were significant relationship, but some weren't. Engels et al (2015), and Sun et al. (2015) found that IGF-1R expression didn't significant associated with age, body mass index and grading histology.^{10,17} On the contrary, Shin et al (2014) and Reinholz et al (2017) showed that there were significant relationship between IGF-1R with grading histology and menopausal status.^{18,19}

The difference in study results might be occurred due to different research location that can be influenced by race living in the areas. IGF-1 level may be affected by environment and lifestyle factors. Discrepancy in results obtained from different measurement method of IGF-1R expression often cause inconsistent results about IGF-1R expression. IGF-1R molecules might be controlled between cytosol and membrane cell and IGF-1R cytoplasm representing bound, internalized receptor. Depending on grade and pathology features of invasive tumour, there might be a failure in transporting IGF-1R to the surface of cells.

There were few limitation in this study. First, to date, there was no uniform cut-off levels for IGF-1R expression. Therefore, researchers categorized IGF-1R immunohistochemical staining results using allred score. Second, body weight of patients obtained in this study was measured at initial diagnosis. Those patients maybe previously obesity, but due to suffer from cancer, they had lost weight. This could induce bias in this study.

V. CONCLUSION

After conducted this study, we highlighted several points in the following:

1. There were significant associations between menopausal status, body mass index, and grading histology with IGF-1R expression in invasive breast cancer.
2. There were no significant association between age and histopathological subtypes with IGF-1R expression.
3. Clinicians should do IGF-1R immunohistochemical staining in invasive breast cancer cases that are resistant to tamoxifen therapy.

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Evaluate the feasibility of Pangasius pond farming for waste-water treatment

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Abstract

This paper concerned the environmental pollution of water used for Pangasius farming. Principally, pond must be located and constructed to minimize negative impacts on the other users and the environment. Particularly, the main environmental concerns in the Pangasius farming sector are the waste-water released from the farm to river. Therefore, the water in pond farming has to be taken care of and cleaned. Generally, if the Pangasius farmers pay much more attention to waste-water treatment before discharging to the river, they will avoid the problem of a polluted water source.

Keywords: waste-water treatment, Pangasius farming, pond,

I. INTRODUCTION

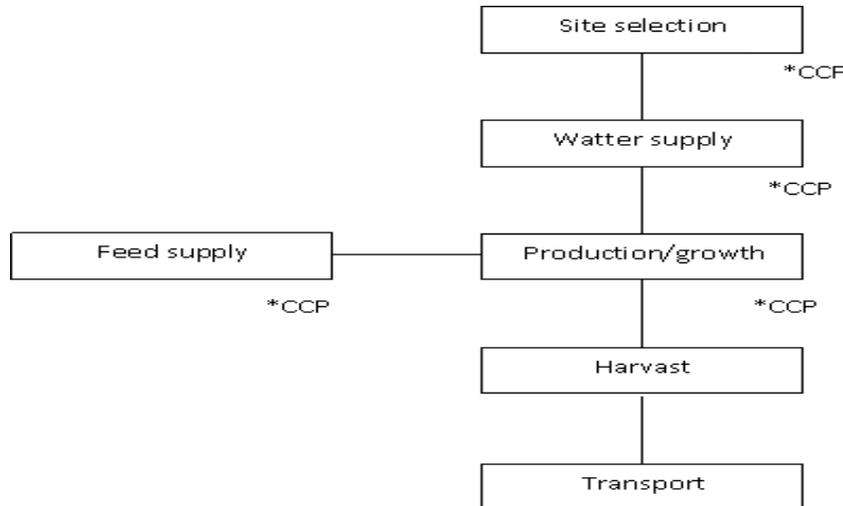
Economic renovation or “Doi moi” policies implemented at the end of the 1980s, and in particular at the beginning of the 1990s, has been important to the development of all sectors of Vietnam’s economy, including fisheries and aquaculture. This shift has led to a gradual shift away from state control to market-based mechanisms. Despite this shift, the government of Vietnam maintains an extensive legal and regulatory framework for the development of the fishery sector, governed primarily by the Ministry of Agriculture and Rural Development (MARD) and the Prime Ministers Office. Besides the policies and regulations issued by the central government, some local policies are implemented at the provincial level. This framework is in principle geared to reorienting the nation’s economy to higher performance in international markets.

The Pangasius products were infected by antibiotics, microbiology and other contaminants. Many Pangasius containers were sent back or destroyed as a result of the strict import quality controls in the EU and the US.

Government can contribute to providing an effective and enabling farming environment that includes introducing regulations that relate to food safety and quality, and providing arrangements to certify input quality. To implement these activities, law enforcement is needed, which implies a well-functioning official system. If the official system does not work properly, farmers may be reluctant to enter into exchanges. Moreover, governments can enhance the effectiveness of fishery associations’ participation in international consultative policy processes by helping them gain access to information and providing funds to recruit experts to include input in the policy dialogue. Therefore, the role of local authorities in disseminating the proper production technology is very important.

II. RESEARCH DESIGN

The hazard analysis and critical control points (HACCP) system is a management tool for fish safety assurance. While the implementation of HACCP-based safety assurance programs are well advanced in the Pangasius processing sector, the application of such system at the fish farm level is lacking. Reilly & Kaferstein (1997) proposed the critical control points in aquaculture production (Figure 1).



*CCP: Critical control point

Figure 1 Model flow diagrams of CCPs for aquaculture production (Reilly & Kaferstein, 1997)

There are four CCPs associated with the proposed model in Figure 1., which are steps where control is necessary to prevent or eliminate a fish safety hazard or to reduce it to an acceptable level. These CCPs are site selection or pond location, the water supply, the input (fingerlings, feeds, chemicals) supply, and production or grow-out steps. The nature of CCPs will depend on the aquaculture system and it is essential to consider the unique conditions that exist within each fish farm when developing an HACCP system. The implementation of the HACCP system in fish farms that have adopted good aquacultural practices (GAP), is recommended as a method to improve food safety of aquaculture products (Reilly & Kaferstein, 1997)

* Gaps analysis at the farm level

Gap analysis refers to the differences between standards and the delivery of those standards. It indicates the difference between the quality expected by buyers and the practices they actually receive from farmers. There are some quality requirements that related to Pangasius raw materials purchased by buyers such as color, size, disease and antibiotics residues. Specially, it requires that fish farmers undertake quality control at the farm level based on good aquaculture practices (GAP). GAP are defined as those practices of the fish sector that are necessary to produce quality fish products conforming to fish laws and regulations (Reilly & Kaferstein, 1997). It includes the determination of critical control points (CCPs) in order to prevent or reduce food safety hazard to an acceptable level. The CCPs at Pangasius farm level were described in Figure 1. The farmers should apply the control measures at CCPs and monitoring and verifying of CCPs thereby enabling the assurance of fish quality and safety during culture process.

While there is widespread recognition of the need to enhance quality management in *Pangasius* aquaculture in the Mekong Delta, there remains a great need to increase the understanding and application of better management practices (BMPs) at the farm level. BMPs for *Pangasius* will be analyzed because they are practical norms that are applicable in small-scale farms. The analysis will focus on the CCPs for fish safety and quality done by farmers practically in order to meet the requirements of market access. From these issues, the gaps of quality assurance will be examined in order to point out the measures necessary to improve and assure fish quality at the farm level.

In Vietnam, particularly, some researches in relation to fishery quality chains were conducted. They focused on a growing customer demand for stable and high quality products. Processors make good products and control product quality. But, hazards are still not free from fish products because there are many quality problems occurred at the primary production. Inadequate quality management during primary production has caused hazardous infection in raw materials. Raw material production is crucial for fish quality as deficient treatment cannot be corrected later. Small farmers play an important role in this part of the production. Aquaculture production in many countries in Asia is from small-scale family-owned smallholders (Silva et al., 2009). *Pangasius* production supports the livelihoods (directly and indirectly) of 80,000 individuals and provides an additional 105,000 jobs in the processing sector.

III. RESEARCH FINDINGS

The water pollution is the result of discharges of untreated farm effluent to public river. This can cause self-pollution and disease outbreak, which has resulted in the collapse of business and abandonment of farms. Therefore, the water in pond farming has to be taken care of and cleaned. Generally, if the *Pangasius* farmers pay much more attention to waste-water treatment before discharging to the river, they will avoid the problem of a polluted water source.

It is needed waste-water treatment system for pond water effluents. Water effluents must meet criteria before being discharged to the outside environment. As a result, the building water treatment system is the most important issue that related to aquaculture environmental pollution.

One research conducted by Lang *et al.* (2009) to examine the environmental consequences arising from *Pangasius* pond farming. The results showed that the COD¹ concentration in effluent releasing from pond water was 34mg/l that exceeded the maximum allowable concentration of COD in surface water (<10mg/l) according to Vietnam standards (TCVN 5942 – 1995). Therefore, they proposed the trickling filter technology which is the most cost-effective option of small-scale farmers. In this research we analyze the cost-benefit of constructing waste-water treatment system by applying trickling filter technology for the various scale of pond farming. This research explores the economical aspects of five scenarios with and

¹ Chemical oxygen demand (COD) is a chemical measure of the amount of organic substances in water or waste-water

without waste water treatment system. The costs and benefits of alternative interventions are evaluated using the cost-benefit analysis (CBA) method to support the decision making process of constructing waste-water treatment system. Table 19 presents Pangasius production costs and returns for the assumed base scenario of with and without waste-water treatment system.

Assumption

- + Pond water surface area: 5,000 m² (average pond area in the small-scale farms)
- + Pond volume: 20,000 m³ (pond water depth of 4 meters)
- + Daily discharged wastewater: 6,000 m³ (average discharged rate of 30%)
- + COD concentration needs treating/cubic meter of wastewater: 0.034 kg/m³
- + COD load needs treating daily: about 200 kg (= 6,000 m³ * 0.034 kg/m³)
- + Pollution load rate (PLR): 0.098 kg of COD/kg of Pangasius produced
- + Life span of trickling filter system: 30 years
- + Water treatment pond (26% x 5,000 m²) = 1300 m²
- + The fish output: 150 tonnes for 5000m²
- + The cost per kg for waste-water treatment is 13,000 VND and profit is 16,000VND
- + The cost per kg for without waste-water treatment is 12,330VND and profit is 13,478VND

Table 1 *Cost benefit analysis of constructing waste-water treatment system*

Unit: 1,000,000 VND

System	Investment cost	Annual OM cost	Production cost	Total cost	Total benefit	B/C ratio
Scenario 1*	0	0	3,940	3,940	4,277	1.085
Scenario 2** (NPV)	887	763	21,315	22,965	25,861	1.126

*Scenario 1 pond areas 5,000 m² (without waste-water treatment) – one year only

*Scenario 2 pond areas 5,000 m² (with waste-water treatment) – 30 years

Source: adapted from Lang *et al.* (2009) and author’s calculation, 2018

The results of CBA were presented in table 1. For this analysis, the present value of costs and benefits are combined in order to calculate the net present value (NPV) and B/C ratio of constructing waste-water treatment after 30 years. The flow of costs and benefits were discounted at 10% discount rate. It can be seen from the Table 1 that B/C ratio is greater than 1 for both scenario. However, scenario 2 has a B/C ratio greater than scenario 1. This means that investment in waste-water treatment is more beneficial than not investing on these facilities. The viewpoints of this analysis have both economic and social issues for sustainable development and environment – friendly culture of Pangasius.

In order to select the optimal waste-water treatment system, an analysis of scale effect will be made. We continue to calculate the NPV, IRR, and BCR for the cases of ponds larger than 5,000m² such as 10,000 m², 15,000 m², or 20,000 m². The results will give the farmers the optimal selection for constructing waste-water treatment pond. Our objective is to test whether

scale effect apply. According to Mr Vinh (2009), we need to consider the cooperation of small-scale farm operators to increase the pond farming areas without increasing the number of farm. For example, the cooperation of 2 farms with total of 10,000 m² is more effective than 10 farms with total of 10,000 m². The reason is that more farms would mean more challenges in managing human behavior and organizing small farms together to share cost. An economic analysis of Pangasius production was conducted with four alternative farm areas for waste-water treatment system. Cost benefit analysis for this section focuses on financial perspective of building water treatment system. Financial analysis gives a greater hope for project feasibility as presented by the Net Present Values (NPV), internal rate of return (IRR), and B/C ratio in the outline of cost-benefit analysis. Table 2 shows the results of cost benefit analysis of 4 alternative scenarios with waste-water treatment system.

Table 2 NPV, IRR, and B/C ratio of alternative scenario

Unit: 1,000,000VND

System	Investment cost	Annual OM ² cost	Production cost	NPV cost	NPV benefit	NPV profit	B/C ratio	IRR	Cost per kg
Scenario 2**	887	763	21,315	22,965	25,861	2,896	1.126	45%	0.0142
Scenario 3***	1,634	1,093	42,380	45,355	51,721	6,366	1.140	52%	0.014
Scenario 4****	2,476	1,548	62,396	67,194	77,582	10,388	1.155	55%	0.0138
Scenario 5*****	2,791	1,991	83,714	88,495	103,442	14,945	1.169	67.42%	0.0136

Scenario 2** pond areas 5,000 m² (with wastewater treatment) – 30 years

Scenario 3*** pond areas 10,000 m² (with wastewater treatment) – 30 years

Scenario 4**** pond areas 15,000 m² (with wastewater treatment) – 30 years

Scenario 5***** pond areas 20,000 m² (with wastewater treatment) – 30 years

Source: Author’s calculation, 2018

It is clearer there is the scale affect to the areas of pond. Expand the farm scale leads to higher NPV. The data confirms rather strongly the direct relationship between farm size and farm efficiency, in that smaller farm size gives a lower net farm income (see table 10.3). Moreover, we look at the cost per kg of fish. The findings showed if the pond farm areas increased from 5000m² to 20,000 m², the cost per kg of fish will decrease from 14,208 VND to 13,688 VND.

IV. CONCLUSION

In conclusion, to construct effectively the waste-water treatment system requires both local government support and the farmers’ skills in order to monitor and maintain this system properly. For example, the agricultural infrastructure, particularly irrigation and transportation network, must be improved as a prerequisite for better waste-water treatment system practices. As a result, the local government has set up the aquaculture specialization areas to promote more efficient use of the irrigation system for water supply.

² OM: Operation and management

Currently, water management in Vietnam is organized based on the law on water resources which came into effect in 1999. The law presents a river basin approach to water resource management involving all stakeholders at national level and aims to strengthen coordination between provinces among the river basins at local level. Moreover, a concept of water right is pointed out and financial obligation of water users, including compensation for polluting water is stated. A fine of 2,000,000 VND is charged to the polluter. In 2012, the Ministry of Natural Resources and Environment (MoNRE) was created and it took over the main water management responsibilities from MARD. MoNRE has recently finalized national standards for water quality and is working toward strengthening the environmental monitoring network. In each province of Viet Nam, a Department of Natural Resources and Environment (DoNRE) attached to the People's Committee supports locally the action of the MoNRE.

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A systematic study on classical cryptographic cypher in order to design a smallest cipher

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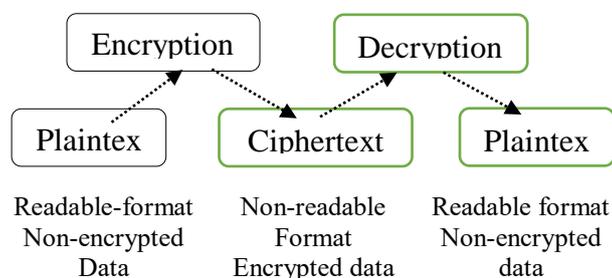
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Abstract- The cryptography is the branch of Cryptology. It is a combination of mathematics and computer Science. It is the study of obscuring information in cyberspace. Cipher is a set of algorithm which comprise of encryption and decryption. The cipher paly important role in modern technology. The technologies involving communication including the Internet, Mobile Phones, Digital Television, and ATM machine rely on cipher in order to maintain security and privacy. Thinking about aforesaid importance of cipher in cryptography, in this article, we have designed a smallest cipher which may be efficient in RFID chips. The smallest cipher has been comprised of five mathematical operation: Exponentiation, Multiplication, Addition, Subtraction and Division based on systematic study of classical cipher. The proposed cipher is a keyless cipher, but it is very efficient in secret information passing.

Index Terms- Cryptography, Classical Cypher, Smallest cipher

1. INTRODUCTION

In cryptography, a cipher is an algorithm for encrypting and decrypting data. To encipher a message, we need to convert information into cipher or code using encryption algorithm.



Cryptography has been numerous phase of evolution. Early ciphers were designed to allow encryption and decryption by hand but those are developed and used today due to emerging computer technologies and its sophisticated performance. A list of classical cipher is given bellow.

1.1 Classical Cypher

XOR cipher, NULL Cipher, Baconian Cipher, Caesar Cipher, ROT₁₃ Cipher, Affine Cipher, Atbash Cipher, keyword cipher, Auto-key Cipher, Bifid cipher, Trifid cipher, Railfence Cipher, ADFGVX Cipher, ADFGX Cipher, Straddling Checkerboard Cipher, Permutation Cipher, Running Key Cipher, Nomenclators Cipher, Four-square cipher, Beaufort Cipher, Base64 Cipher, Lorenz Cipher, Enigma Machine Cipher, Polybius Square Cipher, Simple Polybius Cipher, Porta Cipher, Vigenere Cipher, Homophonic Substitution Cipher, Playfair Cipher, Hill cipher, Fractionated Morse Cipher, Scytale Cipher, Grille Cipher, VIC Cipher.

The remaining of this article is organized as a follows. Section 2 present classical literature review, Section 3 presents author contribution, Section 3.1.for illustration of proposed cipher, Finally, Section 4 and 5 show conclusion and acknowledgement.

2. Literature Review of Classical Cypher

2.1 XOR cipher

This is an additive cipher. It was invented in 1917 by Gilbert Vernam who was an engineer at Bell Telephone Laboratory. It is computationally inexpensive, however, it is vulnerable in plaintext attack and frequency analysis. It is often used in computer malware. The details can be found in [1-2].

2.2 NULL Cipher

It means that nothing Cipher. It is used in Steganography. This cipher can confuse the cryptanalyst to presume real message. The NULL cipher used to prison inmates in order to detect their most suspicious messages passing inspection. The detail of this cipher can be found in [3-6].

2.3 Baconian Cipher

It is used in steganography. This was invented by Francise Bacon in 1605.It can hide the message and distract a person from finding the real one. It offers a

very little security. The details of the Baconian Cipher can be found in [7-8].

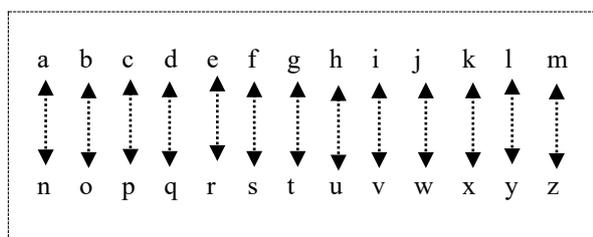
2.4 Caesar Cipher

It is one of the earliest cipher in cryptography. It is a substitution cipher. It was invented by Julius Caesar. The encryption is done by modular arithmetic using modulus 26. It first transform the letters into decimal number then apply modulus 26. It does not provide security. It has not any application in modern technology. The details about this cipher can be found in [9-10].

2.5 ROT₁₃ Cipher

It is a substitution cipher. The letter are replaced after 13th rotating. The ROT₁₃ Cipher is variant of Caesar cipher which was developed in Rome. In Mathematics, this is sometimes called an involution. In cryptography, it is called a reciprocal cipher.

ROT₁₃



Its strength is limited. It does not offer any security. It is used in puzzle solution. The details about this cipher can be found in [11-13].

2.6 Affine Cipher

It is a mono-alphabetic substitution cipher where each letter is mapped to its numeric number. It uses simple mathematical method for doing both encryption and decryption. It is better than Caesar cipher. It is vulnerable to all of the attacks that work against substitution ciphers. The details about this cipher can be found in [13-14].

2.7 Atbash Cipher

It is a substitution cipher. It has specific key where the letters of alphabet are reversed. It does not provide security and that is why it is vulnerable. The details about this cipher can be found in [14].

2.8 keyword cipher

It is a mono alphabetic substitution cipher. It can be cracked by some educated guessing. It is used in cryptographic practice. The details about this cipher can be found in [14].

2.9 Auto-key Cipher

It is a polyalphabetic substitution cipher. It is closely related to the Vigenere cipher, although, it uses a different method to generate the key. It was invented by Blaise de Vigenere in 1586. The key of this cipher can be attacked by using a dictionary attack. It is used by American

Cryptogram Association. This is more secure than polyalphabetic. The details about this cipher can be found in [14].

2.10 Bifid cipher

It combines the Polybius Square with transposition cipher and uses fractionation to achieve diffusion. It was invented by Felix Delastelle. It is strong cipher, however, it can be quickly broken using a simulated annealing algorithm for finding the key square. It was not used by a military or government organization. The details about this cipher can be found in [14].

2.11 Trifid cipher

This is a combination of substitution with transposition and fractionation. It was invented by Felix Delastelle. It is vulnerable as keysquare can be revived by cryptanalyst. The details about this cipher can be found in [14].

2.12 Railfence Cipher

This is a transposition cipher. It does not offer communication security. It is used to cryptographic hobby group. The details about this cipher can be found in [14].

2.13 ADFGVX Cipher

It was invented by Colonel Fritz Nebel in 1918. It was a field cipher used by the German Army during World War I. It was a fractionating transposition cipher which combined a modified Polybius square with a single columnar transposition. The fractionating nature of this cipher makes further difficulties. The details about this cipher can be found in [14].

2.14 ADFGX Cipher

This is an extension of ADFGVX Cipher. The key for ADFGX cipher is a keysquare and a keyword. It is just a simple substitution cipher and trivial to break. It is used in cryptographic hobby group. The details about this cipher can be found in [14].

2.15 Straddling Checkerboard Cipher

It is one kind device for converting an alphabet to nonsense manner. It is a substitution cipher. This cipher is vulnerable due to having advancement of Computer. The first step to breaking this cipher is to identify the blank positions in the key. This can often be done with frequency information analysis techniques. It has modern uses such as CodinGame. The details about this cipher can be found in [14].

2.16 Permutation Cipher

It comprises of transposition and substitution cipher. This is known as a regular columnar transposition. The message is deciphered by applying the inverse of the permutation. It is being widely used in modern cryptography. The details about this cipher can be found in [14].

2.17 Running Key Cipher

It is a type of polyalphabetic substitution cipher in which a text is used to provide a very long keystream. It does not repeat the key. A statistical patterns in both the key and the plaintext that can be exploited. It is used in cryptographic practices. The details about this cipher can be found in [14].

2.18 Nomenclators Cipher

It uses the elements of substitution ciphers and codes. This is combined with large homophonic substitution tables. The symbols for whole words is called codewords and letters were not distinguished among ciphertext. It used for diplomatic correspondence, espionage and advanced political conspiracy from the early fifteenth century to the late eighteenth century. It is vulnerable. The details about this cipher can be found in [14].

2.19 Four-square cipher

It is like a Playfair cipher. It is significantly stronger than substitution ciphers. It was invented by Felix Delastelle. It can be easily cracked if both plaintext and ciphertext are known. The details about this cipher can be found in [14].

2.20 Beaufort Cipher

It was created by Sir Francis Beaufort. It was a polyalphabetic substitution cipher. It uses a keyword and tableau recta to encipher the plaintext. It is breakable due cryptanalysts to having expertise knowledge in cryptography. It is used in academic cryptographic practice. The details about this cipher can be found in [14].

2.21 Base64 Cipher

It was originally used to encode binary information like images into a character string consisting of printable characters so it could be sent over the protocols like http. This is a keyless cipher. It provides weak security. It is used in a number of applications including email and storing complex data in XML. The details about this cipher can be found in [14].

2.22 Lorenz Cipher

It was a high security teleprinter cipher machine for communication by radio in complete secrecy. The security of this machine was not so great. It was used during World War II by the German Army for communication. The details about this cipher can be found in [14].

2.23 Enigma Machine Cipher

This device developed and used in the early mid-20th century to protect commercial, diplomatic and military communication. It uses a form of substitution ciphers. It was used by German military during World War II. The details about this cipher can be found in [14].

2.24 Polybius Square Cipher

It is a substitution cipher. The encryption and decryption involved in Polybius square cypher. It offers very little communication security and can be easily broken by hand. The details about this cipher can be found in [14].

2.25 Simple Polybius Cipher

It uses the ASCII table to encrypt and decrypt. Each character convert to ASCII code once upon a time and again converts ASCII to Characters. It is very weak. The details about this cipher can be found in [14].

2.26 Porta Cipher

This is a polyalphabetic substitution cipher. It was invented by Giovanni Battista della Porta. It uses 13 alphabets reciprocally and its enciphering is the same as deciphering. It is strong enough. The Porta cipher can be broken the same way as a Vigenere Cipher. It is recognized by ACA. The details about this cipher can be found in [14].

2.27 Vigenere Cipher

This is a polyalphabetic substitution cipher. It uses a keyword. It is little bit strong than mono-alphabetic substitution cypher. It can be cracked by the Chi-sq statistic test. It is used in cryptographic hobby group. The details about this cipher can be found in [14-17].

2.28 Homophonic Substitution Cipher

This is a substitution cipher. It is much more difficult to break than standard substitution ciphers. It is difficult to break if the number of homophones is higher than as usual. The usual method for cracking is Hill Climbing, It is used in cryptographic exercise. The details about this cipher can be found in [14, 18].

2.29 Playfair Cipher

It was the first practical digraph substitution cipher. It was invented in 1854 by Charles Wheatstone, but it was named after Lord Playfair who promoted the use of the cipher. It has an interesting weakness which is repeated bigrams in the plaintext. It used to tactical purposes by British forces in the Second Boer War and in World War I. The details about this cipher can be found in [14, 19-21].

2.30 Hill cipher

It is a poly-graphic substitution cipher based on linear algebra. It was invented by Lester S. Hill in 1929. It was the first poly-graphic cipher. It has several advantages such as masquerading letter frequencies of the plaintext and high throughput. Noninvertible key matrix is the main disadvantage of this cypher. It is no longer used due to the vulnerability against known plaintext-ciphertext attack. It is still useful when combined with other non-linear operations, such as S-boxes. The details about this cipher can be found in [14, 22-23].

2.31 Fractionated Morse Cipher

It requires convert the plaintext to morse code. It means that plaintext letters are mixed into the ciphertext letters. One of the benefits of the Fractionated Morse cipher is that it can encipher spaces and punctuation just as easily as letters. The trick to breaking Fractionated Morse is that finding the key. It is used by cryptographic hobby group. The details about this cipher can be found in [14, 24].

$$\text{Encipher method: } C = \frac{\{(2^3 * m) + (2^3 - 1) + 1\}}{2}$$

$$\text{Decipher method: } D = \frac{C}{4} - 1$$

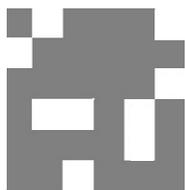
This is keyless cipher which has been implemented intentionally because of this research is to create a smallest cipher which facilitates the user to add their respective secret key in order to hide message from adversary.

2.32 Scytale Cipher

It is the oldest ciphering method. It was difficult for spies to inject false messages into the communication between two commanders because scytale should have same diameter. It could not be easily broken. It used to communicate during military campaigns. The details about this cipher can be found in [14, 24-25].

2.33 Grille Cipher

It was invented by Cardan Grille as a method of secret writing in 1550. The recipient of the message must have possessed an identical grille. The following grid was used to encrypt and decrypt message.



This was an efficient techniques. The method was slow and requires literary skill. Cardan Grille used in both private and diplomatic correspondence. The details about this cipher can be found in [14, 26].

2.34 VIC Cipher

This is a substitution cipher. It is used in several important field of ciphers. It was used by Russian spies during the cold war. It is a combination of several things such as Straddling checkerboard, Double columnar transposition, Lagged Fibonacci generators. The same straddling checkerboard used to encryption and decryption. It managed to remain unbroken. It is well designed and provides quite good security. The details about this cipher can be found in [14, 27].

3 Author Contribution

Presumably let an entity A wants communicate information to other entity B. Entities A and B both should have some confidentiality. The both entities A and B should have same functionalities. An entity A hide the message by solving the equation which consists of Exponentiation, Multiplication, Addition, Subtraction and Division operations. The other entity B opens the message by simply solving an equation which comprises of just two mathematical operations: Division and subtraction.

3.1 Discussion of proposed Smallest Cipher

Assuming that Alice wants to send a secret information A=65 (ASCII value) to Bob, first she encrypts the message as follows.

$$C = \frac{\{(2^3 * 65) + (2^3 - 1) + 1\}}{2} = 264 \text{ and then sends it to Bob.}$$

Receiver Bob decrypts the code by solving following equation:

$$D = \frac{264}{4} - 1 = 65 = A \text{ (The message is successfully retrieved by the recipient).}$$

4 Conclusion

The proposed smallest cipher method is efficient for message encryption and decryption. The proposed crypto-enabled techniques ensure no security because it is a key less cipher. We have created this cipher just doing mathematical problem solving skills. It represents a concrete ciphertext. We would like to keep a clue that is key-addition with the proposed cipher for future cryptographic researchers.

5 Acknowledgment.

We are very grateful by designing and publishing a smallest cipher. We want to thanks all of the members who are continue supporting the Daffodil International University.

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Association Between Immunohistochemical Expression of Vascular Endothelial Growth Factor (VEGF) and Fibroblast Growth Factor-2 (FGF-2) with Histopathology Grade of Meningioma

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Abstract- Meningioma is one of the intracranial primary tumors that often occurs with the incidence in the United States covering 36% of all tumors in the central nervous system. The growth of solid tumors such as meningiomas is highly dependent on angiogenesis. Vascular Endothelial Growth Factor (VEGF) and Fibroblast growth Factor-2 (FGF-2) are angiogenic factors that mediate positive regulation for angiogenesis. Both VEGF and FGF-2 examinations in previous meningioma have been carried out, but using blood serum samples. This research was conducted using a different method that is immunohistochemically from tumor tissue to assess the association between VEGF and FGF-2 expression with histopathology grade among meningioma patients. Formalin-fixed paraffin-embedded tissue blocks of 32 meningioma patients were immunohistochemically studied for VEGF and FGF-2 expression. The association between VEGF and FGF-2 expression with grade were analyzed using SPSS 22 version. Both VEGF and FGF-2 expressions were significantly associated with grade of meningioma ($p < 0.05$). Most negative FGF-2 cases were in grade 1 meningioma (91.6%) and positive FGF-2 were found in 50% in grade 2 meningiomas. While for VEGF expression, although most cases for each VEGF value were in grade 1 meningiomas, but all cases of grade 3 meningioma have high VEGF expression. The positive expression of FGF-2 and the high of VEGF indicate that these two growth factors play a very important role in angiogenesis which triggers cell proliferation, especially for meningioma with higher grade. This can be a prognostic factor and a therapeutic opportunity when surgical intervention and chemotherapy become inadequate management.

Index Terms- VEGF, FGF-2, meningioma, grade, immunohistochemical

I. INTRODUCTION

Meningiomas grow from arachnoid cap cells, which are the outer layers of arachnoid material with slow growth.^{1,2} The average age of meningioma patients is 65 years and the risk will increase with age and the ratio between women and men 3: 2.^{1,3}

Although most meningiomas are encapsulated and histologically benign, some of these tumor sites cause very serious and potentially fatal.⁴ The fourth revised edition of the World Health Organization (WHO) in 2016 has classified and divided the grade of meningiomas into three, grade 1 as benign (75% of cases), grade 2 as atypical (10-15%) and grade 3 as malignant (1-3%).¹ Higher grade meningiomas show a tendency to be progressive and recurrent.⁵ Reported recurrence rates for each grade 1, 2, and 3 meningioma are 7-25%, 29-52%, and 50-94% respectively. Depending on location and grade, treatment options for meningiomas include surgery and postoperative radiation therapy.^{6,7}

Vascular Endothelial Growth Factor (VEGF) is a growth factor that has a major role in neovascularization, increased vascular permeability, and peritumoral brain edema.^{8,9} Besides VEGF, Fibroblast growth Factor-2 (FGF-2) or also called basic Fibroblast Growth Factor (bFGF) is also one of the angiogenic factors that mediate positive regulation for the angiogenesis.¹⁰ Angiogenic factors such as FGF and VEGF stimulate endothelial cells to secrete several proteases and plasminogen activators, resulting in degradation of the basal membrane of blood vessels, which in turn may allow cell to attack the surrounding matrix. Cells migrate, proliferate, and eventually differentiate to form new lumen containing blood vessels.¹¹

At present, several studies have shown promising targeting of angiogenesis regulated by VEGF in meningiomas, especially in patients with recurrent or higher grade meningiomas. Bevacizumab (VEGF inhibitors) as monoclonal antibodies for VEGF receptors can disrupt the binding transduction and signals needed for tumor vascularization which in turn causes regression of tumor blood supply.¹² However, there are several clinical studies that show resistance for VEGF inhibitor. Therefore, there are still many further studies regarding other promising target therapies besides using VEGF inhibitors.¹³

Both VEGF and FGF-2 have been widely studied in several tumors. For meningiomas themselves, examinations of these two angiogenic factors have been carried out using the ELISA method that uses a patient's blood sample. In this study, we interested examining FGF-2 and VEGF at the same time by using a different method that is immunohistochemistry to see its

expression in each histopathological grade of meningioma from the tumor tissue.

II. MATERIAL AND METHODS

Sample selection

This cross sectional study was conducted in Department of Anatomical Pathology, Universitas Sumatera Utara/ H. Adam Malik General Hospital, Medan and includes 32 cases of meningioma. All samples were obtained through surgical procedure. Inclusion criteria were meningioma cases with adequate clinical data, available and formalin-fixed paraffin embedded tissue block with sufficient tumor tissue. Detailed clinical data were obtained from medical records or pathology archives consisting of age, sex, and location of the tumor. Histological type and grade were determined independently by researchers through hematoxylin and eosin stained slides examination.

Immunohistochemistry protocol and interpretation

The tissue sections were deparaffinized and rehydrated before pretreatment. Endogenous peroxidase was blocked with hydrogen peroxide followed by antigen retrieval. VEGF rabbit monoclonal and FGF-2 (GTX84502, GeneTex, California, America) mouse monoclonal antibodies were used as primary antibody. Diagnostic BioSystems (Diagnostic BioSystems, Pleasanton, CA, USA) polymer kit was used for detection. The reaction was visualized with diaminobenzidine and counterstained with Mayer's hematoxylin followed by dehydration, clearing, and mounting. Positive control were hepar for VEGF and colon for FGF-2. VEGF and FGF-2 expressions were determined independently by researchers. The expression in cytoplasm was analyzed. Immunostaining of VEGF and FGF-2 was evaluated in terms of the proportion and staining intensity of tumor cells. VEGF expression was determined using Histo-score (H-score) with a range of possible scores from 0 to 300. H-score 0-19 was considered low, 20-99 was moderate, and 100-300 was considered high expression. While for FGF-2, the proportion was assessed on the basis of the percentage of immunopositive cells as follows: 0, less than 10%; +1, 10-25%; +2, 26-50%; +3, 51-75%; +4, greater than 75%. Staining intensity was evaluated as negative (0), weak (+1), moderate (+2), and strong (+3). The proportion score (0-4) was multiplied by the intensity score (0-3) and a final score was assigned, 0-4 as negative staining and 5-12 as positive staining.

Statistical analysis

Statistical analysis was performed using SPSS software package version 22.0 (SPSS Inc., Chicago) and Microsoft Excel 2010. Categorical variables were presented in frequency and percentage. Mann-Whitney, Kruskal-Wallis, and Dunn test were applied to find out the association between VEGF and FGF-2 expressions with histopathology grade of meningioma. The p-values < 0.05 were considered significant.

III. RESULT

Patients' characteristics

The mean age for meningioma patients was 44.5 (\pm 11.4) years. Twenty-three patients (71.9%) were females, only 9 patients (28.1%) were males. All the tumors were located in intracranial where convexity was the predominance. The number of the patients with WHO Grade 1 meningioma was 25 (78.1%), with Grade 2 meningioma was 5 (15.6%), and with Grade 3 meningioma was 2 (6.3%). The histological subtypes of meningioma varied and meningothelial meningioma was the majority of this case. Clinical basic characteristic of meningioma patients were summarized in table 1. Representative H&E sections are shown in figure 1.

Table 1. Characteristic of meningioma patients

Characteristics	Number of cases	Percentage (%)
Age, mean \pm SD, years	44.5 \pm 11.4	
Sex		
Female	23	71.9
Male	9	28.1
Location		
Supratentorial	28	87.5
Convexity	23	82.1
Parietal	8	34.8
Frontal	4	17.4
Temporal	1	4.3
Temporoparietal	6	26.1
Frontoparietal	3	13
Parietoccipital	1	4.4
Sphenoid	2	7.1
Parasagittal	1	3.6
Suprasella, parasella	2	7.1
Infratentorial	4	12.5
Cerebellum	1	25
Foramen Magnum	1	25
CPA	2	50
Subtype		
Meningothelial	11	33.4
Fibroblastic	4	12.5
Transitional	5	15.6
Psammomatous	2	6.3
Angiomatous	1	3.1
Microcyst	2	6.3
Chordoid	1	3.1
Clear cell	1	3.1
Atypical	3	9.3
Anaplastic	2	6.3
Histological grade		
Grade 1	25	78.1
Grade 2	5	15.6
Grade 3	2	6.3

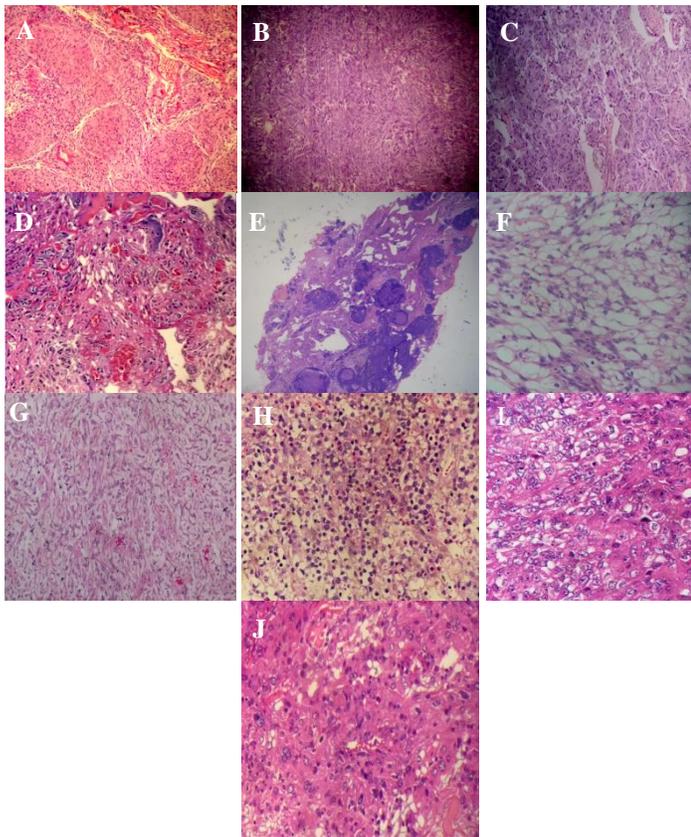


Figure 1. Histological type. A, Meningothelial meningioma. B, Fibroblastic meningioma. C, Transitional meningioma. D, Angiomatous meningioma. E, Psammomatous meningioma. F, Microcyst meningioma. G, Chordoid meningioma. H, Clear cell meningioma. I, Atypical meningioma. J, Anaplastic meningioma.

VEGF expression

Sixteen out of 32 meningiomas show low score for VEGF, 8 cases for moderate and also high score. In meningiomas grade 1, most of cases were low score but all of meningiomas grade 3 express VEGF in high score (table 2).

Table 2. Association of VEGF expressions with histopathology grade

VEGF	Grade						p-value
	Grade 1		Grade 2		Grade 3		
	n	%	n	%	n	%	
Low	13	81.2	3	18.8	0	0	0.039
Moderate	8	100	0	0	0	0	
High	4	50.0	2	25.0	2	25.0	

*Kruskal-Wallis test

Generally there was a significant p-value between score VEGF and histopathology grade of meningioma. But based on post hoc test, there is no significant in group of low VEGF versus moderate VEGF (table 3). The intensity of VEGF expression in cytoplasm are shown in figure 3.

Table 3. Post hoc test in each value of VEGF

Post Hoc	p-value*
Low vs Moderate	0,168
Low vs High	0,029
Moderate vs High	0,007

*Dunn test

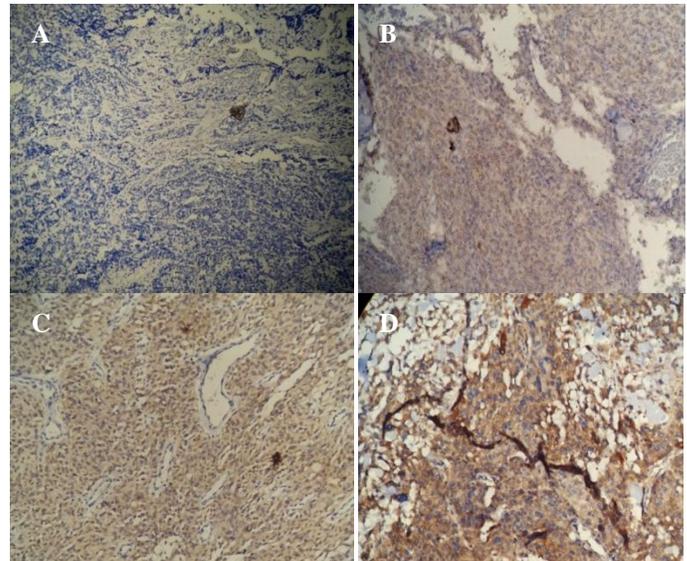


Figure 3. Immunohistochemical VEGF expression. A, Negative intensity. B, Mild intensity. C, Moderate intensity. D, Strong intensity.

FGF-2 expression

Twenty-four out of 32 meningioma cases were negative for FGF-2 and most cases are in grade 1, while positive expression was seen in eight cases and 50% cases are in grade 2 (table 4). The intensity of FGF-2 expression in cytoplasm are shown in figure 3.

Table 4. Association of FGF-2 expressions with histopathology grade

FGF-2	Grade						p-value*
	Grade 1		Grade 2		Grade 3		
	n	%	n	%	n	%	
Negative	22	91.6	1	4.2	1	4.2	0.002
Positive	3	37.5	4	50.0	1	12.5	

*Mann-Whitney test

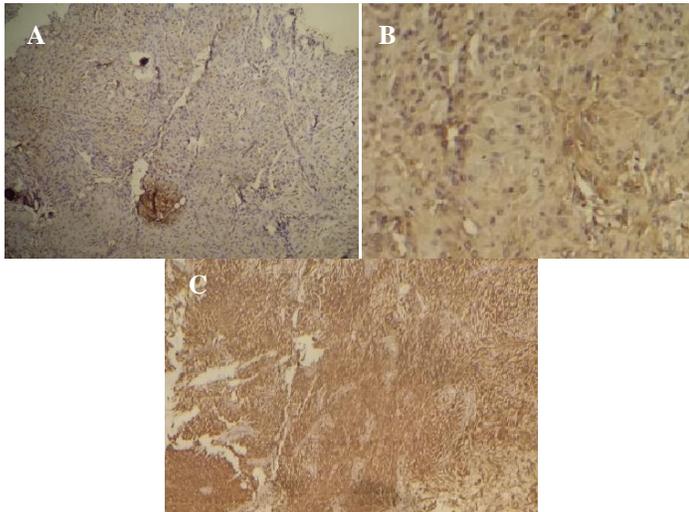


Figure 3. Immunohistochemical FGF-2 expression. A, Negative intensity. B, Mild intensity. C, Moderate intensity.

IV. DISCUSSION

Meningiomas account for 25-30% of all primary tumors in the central nervous system, are slow-growing tumors, most common in middle-ages and elderly with a peak incidence of the sixth to seventh decades.¹ The prevalence rate in the United States confirmed by pathology examination of 97.5 per 100,000 populations.⁴

Several studies have also reported an association between meningioma and VEGF expression, with different results. Although higher vascularization is found in high-grade tumors, the correlation between histological grade and VEGF expression in meningiomas is still unclear. Most brain tumors secrete excessive VEGF, which leads to tumors with abnormal vascular permeability. This hyperpermeability allows fluid to leak from the intravascular space to the brain parenchyma causing an increase in interstitial fluid pressure and vasogenic cerebral edema. A positive correlation between VEGF and edema has been found in a number of previous studies.^{8,14-16}

VEGF is a regulator of vascularity, angiogenesis, and vascular permeability. This may play an important role in the formation of peritumoral brain edema (PTBE) associated with meningioma.¹⁵ High VEGF expression and the presence of PTBE have been proposed as predictors of recurrence in benign meningioma (grade 1).¹⁷ There were 4 cases of grade 1 meningioma in this study with a high VEGF score, but the PTBE status was not evaluated by the author and no long-term observation was carried out on these four patients, so it cannot be predicted whether the recurrence in these patients is increasing.

Some studies suggest that VEGF expression correlates with meningioma vascularization while others do not. One of the reasons for this difference is the involvement of angiomatous meningiomas and meningiomas with higher grade, such as atypical and anaplastic meningiomas. Angiomatous meningiomas usually show the highest microvascular density (MVD), but VEGF levels are not always the highest. Higher grade meningiomas show an increase in VEGF without an increase in MVD. Lamszus, et al. reported that VEGF is contained in protein extracts from human meningioma tissue induced capillary-like

tube formation and in vitro endothelial cell migration. These findings indicate that VEGF is involved in angiogenesis in meningiomas, but increased VEGF expression does not result in an increase in the number of blood vessels with an increase in histological grade.⁹

Meanwhile, in order to grow bigger and attack the surrounding tissues as well as grade 2 and 3 meningiomas, tumors must be able to induce new blood vessel growth. New blood vessel growth is a regular process that depends on coordinated signaling by growth factors and cell adhesion receptors, one of which is VEGF.¹⁷ This is illustrated by the significant correlation between moderate and high VEGF expression and grade in this study.

VEGF expression in meningiomas has been shown to vary with respect to grade and histological subtype. Research by Dharmalingam, et al. note that no significant association can be shown in all grade of meningiomas. In addition, the level of expression as described by VEGF assessment and expression patterns (focal or diffuse) did not differ significantly between grades. The study noted that transitional meningioma had a high VEGF positivity (81.8%), followed by meningothelial meningioma (66.7%), while fibroblastic meningioma showed the least (12.5%). Angiomatous meningiomas express very high VEGF expressions because of the features inherent in this subtype. Denizot, et al. showed, by quantitative analysis of VEGF by ELISA, that fibroblastic meningiomas showed lower VEGF level compared to meningothelial and transitional subtypes.¹⁸ While Mahzouni, et al. explained that there was a significant relationship between VEGF expression and grade but there was no significant relationship between VEGF expression and subtype.¹⁹ In this study, there was a relationship between VEGF expression and grade, while no analytical test was carried out between VEGF expression and subtype because not all meningioma subtypes were found. However, it can be seen that from 4 cases of meningioma grade 1 samples there was a high VEGF score, for 1 case of angiomatous subtype, 1 fibroblastic, and 2 cases of transitional subtypes.

VEGF expression is also correlated with survival progression where it is concluded that VEGF is significantly correlated with tumor development and recurrence.¹⁶ This is seen in the case of grade 3 meningioma in this study. All cases of grade 3 meningioma express high VEGF because indeed the grade increases, the higher the rate of recurrence of this neoplasm. But the limitations of this study, no long-term observation of these meningioma patients will be done whether they will experience a recurrence or even previously this patients had a history of meningioma disease.

Significant FGF-2 levels and receptors, FGFR1 and FGFR2 have been detected in meningiomas. FGF becomes a mitogen, differentiation and angiogenic agent that can influence tumor development as an autocrine growth factor.²⁰ FGF exerts extensive mitogenic activity by stimulating the growth of fibroblasts, endothelial cells and cancer cells. FGF-2 is an important regulator of cell growth and differentiation in physiological and pathological conditions.²¹ FGF-2 is present in any part of the body and has a strong affinity for glycosaminoglycans such as sulfate deposits. FGF-2 is stored by binding of glycosaminoglycans to the cell surface or extracellular matrix. When FGF-2 is actually needed, the cell secretes various

enzymes such as heparinase that release FGF-2 from glycosaminoglycans so that it can reach the target cell. Previous research has suggested the role of FGF-2 as a prognostic marker for various types of malignancies.²²

The relationship between FGF-2 and histopathological grade of meningioma has also been investigated by Risfandy, et al. but using a patient's blood serum sample and not from the tumor tissue. From the analytical test it was found that there was no significant relationship between this two growth factors.²³ In contrast to the immunohistochemical studies in this study, a significant association was found between FGF-2 expression and histopathological grade of meningioma. This may be due to the different number and distribution of samples. Risfandy only classified meningioma grades into 1 and 2, while the authors divide the grade according to the WHO classification of 1, 2, and 3. Although considered not significant association, Risfandy et al revealed that higher serum FGF-2 levels were found in meningiomas with higher grade. This can show that FGF-2 as a growth factor plays a role in cell proliferation and angiogenesis more in higher grade meningiomas. Angiogenesis itself is controlled by a balance of promoters and inhibitors. FGF-2 has received attention as another very potential angiogenic growth factor beside VEGF. Although the detailed mechanism of the relationship between FGF signals and the onset of the emergence of malignant tumors is still unclear. However, at this time, mutation of FGF receptor was assumed to activate the FGF signal constantly and ultimately encourage the growth and metastasis of tumor cells.²²

This study used FGF-2 immunohistochemical techniques in meningioma cases where most meningiomas are benign (grade 1). Denizot, et al. also carried out analysis of FGF-2 levels through tumor tissue samples, but used the quantitative ELISA method. Based on the results obtained, there was no significant association in FGF-2 levels among the subtypes of meningioma grade 1.²⁴ Study of Baritaki, et al. also evaluated FGF-2 from tissue samples through qRT-PCR examination for cases of brain tumors including glioma, meningioma, and metastasis. All cases of meningioma show higher expression compared to normal brain tissue. But unfortunately in their study, all cases of meningiomas are included in the benign group, so it cannot be seen in comparison with cases of higher grade meningiomas.²⁵ In this study although most cases of meningiomas gave negative expression results in 24 of 32 cases and did not take normal brain tissue samples for comparison, but there is a significant association between FGF-2 expression and histopathological grade of meningioma.

It is also important to think that in most studies, serum and intratumoral levels of FGF-2 were associated with decreased survival rate. High intratumoral and serum FGF-2 levels are also associated with recurrence of various types of cancer such as lung, bladder, breast, esophagus and Hodgkin Lymphoma.^{21,26} Donnem, et al. explained in their study that high FGF-2 expression in the NSCLC case had a 37% rate for 5 years of survival, while for low FGF-2 expression, survival rate had increased to 59%.²⁶

Both FGF-2 and VEGF expressions in this study had significant association with histopathological grade of meningioma. Synergistic action of FGF and VEGF has been observed and crosstalk between these two families has been

suggested and considered an important arrangement in the formation of blood vessels and this mechanism has long been a basic question in vascular biology that is not understood. Data from the Murakami study, et al. shows how these two angiogenic growth factors regulate the neovascularization process in a coordinated way.²⁷

VEGF and FGF-2 show the same MVD in tumor xenografts, but tumor growth rates induced FGF-2 were significantly higher than VEGF in vivo. These findings indicate that abnormal leakage in tumor blood vessels can affect tumor growth, supplying oxygen and nutrients in insufficient quantities. On the other hand, blood vessels were induced by FGF-2 allow tumors to access an adequate supply of oxygen and nutrients and the disposal of waste products; as a result, tumors can continue to grow with a high growth rate. However, abnormal leakage of blood vessels induced by VEGF may be useful for effectively delivering large molecular size anticancer drugs into tumors due to increased endothelial fenestration with low pericyte protection.²⁸

Beside interactions with the VEGF, FGF-2 can control the function of growth factors and other chemokines, such as PDGF, HGF, and MCP-1. Although the exact mechanism of this interaction remains unclear, it is interesting to speculate that FGF-2 can modulate many neovascularizing processes.²⁷ VEGF and FGF-2 play a unique role in synergistic enhancement of endogenous PDGF-B-PDGFR β signaling, to promote the formation of mature blood vessels in addition to the long-known mitogenic effects.²⁸

In many experimental trials, angiogenesis-driven FGF-2 is blocked by VEGF inhibition, which shows that FGF-2 controls the upstream VEGF angiogenesis by modulating VEGF function. This hierarchical regulation seems to play a similar role in lymphangiogenesis, as lymphatic growth induced by FGF-2 is inhibited by the blockade of VEGFR3 signaling.²⁸ Although VEGF inhibitor therapy can cause vascular disintegration and regression not only in many experimental studies, but also in human clinical trials, blood vessels rapidly rebound when VEGF inhibition is withdrawn.²⁷ In normal tissue, while VEGF-induced vessels contain high endothelial fenestration that mediate high permeability, blood vessels induced by FGF-2 do not have vascular fenestration.²⁸ The combination of inhibition of FGF-2 and VEGF signals may have a much deeper effect on blood vessels, because a rebound in vascular growth may not occur without VEGFR2 expression. FGF-2 signaling is indispensable for the maintenance of VEGFR2 expression, and its inhibition has a profound effect on biological processes that depend on VEGF.²⁷ Since recent years, the FGF-2 signaling pathway has been stated to contribute in tumor angiogenesis, cell proliferation, and resistance to chemotherapy and VEGF inhibitor therapy for several types of human cancer in preclinical and clinical studies.²⁸

V. CONCLUSION

There is significant association between VEGF and FGF-2 expression with histopathology grade of meningioma.

COMPETING INTERESTS

The authors have no relevant financial interest in the products or companies described in this article.

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ETHICAL APPROVAL

Health Research Ethical Committee, Universitas Sumatera Utara, Medan, Indonesia approved this study.

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Economic Roles and Constraints of Micro and Small Enterprises in Ethiopia: Case from Wolkite Town

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Abstract- This study investigates the socio-economic impacts and determinants of micro and small enterprises (MSE) using 100 samples of MSEs in Wolkite town. The majority of enterprises in the surveyed town are MSE and large numbers of the residents made their livelihood through micro and small enterprise. The finding of the study reveals that MSEs have socio-economic impacts such as employment opportunity and income generation. In terms of sector, manufacturing creates more job opportunity than service and trade sector. In terms of ownership type, sole proprietorship types of business employ more people than cooperative business which is because most business in the surveyed town is owned by individual's entrepreneurship. However, these enterprises are adversely constrained by business formality, business training, limited finance access and lack of market. Since MSE are diverse by their nature, their socio-economic impact and the constraint they do face also varies accordingly. Therefore, policies and support programs that promotes for the growth of MSEs should consider these aspects of divergences.

Index Terms- micro and small enterprise, economic roles, constraints, Wolkite town, Ethiopia

I. INTRODUCTION

For the past three decades a large number of developing and international organizations realized the importance of developing micro, small and medium sized enterprises as a way of achieving several goals. Such as providing work opportunities, adding to the GDP, creating needed input for larger enterprise and contributing to the export sector. In order to realise the characteristics of micro and small enterprises (MSE, here after), their possibilities and constraints, studies were conducted all over the world. Some of the studies explore the economic motivation, capabilities, sources of finance, dynamic and links with other firms and within the market, while other studies concerned in employment creation, entrepreneur-worker relationships, dispute settlement mechanism and trade union affiliates (Mahdi & Osman, 2000).

In the majority of fast developing countries, micro and small enterprises by virtue of their size, location, capital investment and their potential to generate greater employment have proved to have crucial effect for rapid economic growth. Furthermore, the sector also doesn't require high level training, much capital and sophisticated technology. More importantly, MSE creates job opportunities for a substantial segment of the population.

However, most MSE face critical constraints at the start up and operation level. Among some of the constraints, included are lack of access to finance, lack of access to premise or land, lack of infrastructure, lack of entrepreneurial and managerial skills, lack of information on business opportunities, social and cultural facts and excessive corruption (Commission for Legal Empowerment of the Poor, 2006).

Like many other developing country, Ethiopia is a country which have many number of MSE that can absorb a lion share of the labour force and add up to the GDP of the country. While the importance of large industries and enterprise for the growth of Ethiopian economy can not be denied, there is ample evidence that the labour absorptive capacity of the Micro and small enterprise sector is very high, the average capital cost per job created is lower than big business and its role in technical and other motivation activities is vital for many of the challenges facing the country. According to the 1996 survey by CSA, the whole labour force engaged in MSE is more than eight fold (739, 898) to that of the medium and large scale manufacturing industries (90, 213 people) (Ministry of Trade and Industry, 1997).

By understanding the relevance of MSE, the Ethiopian government has recognized and paid due attention to the promotion and development of MSE sectors for they are important vehicles to address the challenge of unemployment, economic growth and equity in the country. For achieving these objectives, the government of Ethiopia has formulated a national MSE strategy in 1997 and revised the strategy in 2012 which emphasis on to alleviate the problems and promote the growth of MSE sector (Ministry of Trade and Industry, 1997: Ministry of Urban Development and Housing, 2016).

In order to fill the gap of knowledge on the existing literature on MSE of Ethiopia, this paper examines the socio-economic attributes of MSE and their constraints. The objective of this study is to investigate the major socio-economic impacts and constraints of micro and small enterprises using a new survey.

II. MATERIALS AND METHODS

1. Description of the study area

Wolkite town (the case study area for this paper) is found in southern part of Ethiopia in the region of southern nation and nationalities of people republic (SNNPR). The town comprised of the total population of 39,854 from this figure 19,641 are males and 20,213 are female. The town is the capital city of gurage zone and located 158 kilo meters from Addis Ababa (south of Addis

Ababa). Furthermore, the town is divided into two sub-city such as Addis ketema sub-city and Bekur sub-city.

The majority of the residents of the town are engaged in micro and small enterprise. In terms of ownership types, micro and small enterprise of Wolkite town can be classified as sole proprietorship and cooperatives. The sole proprietor types of micro and small enterprises are self-operated or two or more paid labourers and/or non-paid family members. The majority of MSEs of Wolkite town are the sole proprietor types.

The cooperative enterprises are established by a group of 5 to 10 or sometimes more people. The establishment of these types of enterprises are supported and their working conditions are facilitated (access to credit service, access to land, etc) by Wolkite town micro and small enterprise agency in collaboration with other government organs in Wolkite town such as Omo micro finance, integrated housing development project office, the municipality and other responsible government organs. The three major sectors operated by sole proprietors and cooperative types of MSE are trade, service and manufacturing. 1) trade include: sales of all goods, local drinks, construction materials, clothes and shoes, music or video, electronic equipment, vegetables and fruits, drug store, stationary and general food items, 2) service include: barber and beauty salon, bicycle rent and repair, bar/restaurants and hotels and 3) manufacturing include: bakery, tailor, the production of brocket and precast beam, grain mill and wood and metal work.

2. Data collection procedure and samples

The data used for this study is obtained through a structured questionnaire surveyed by the Author from Wolkite town in January 2009. The total sample of the survey is 100 MSE (80 sole proprietorship and 20 cooperatives) among the different categories of MSE. In identifying the sample, stratified sample selection procedure is utilized in order to have representative sample. In order to investigate the necessary information and evidence, detailed questionnaires are structured. The designed questionnaire is wide and includes questions related to individual owner's related factors (owner's age, marital status, gender, experience, training etc) and firm related factors (employment opportunity, income generation, age and size of business, access to finance, marketing, business location, the type of sector, etc).

3. Method

Descriptive statistics and econometrics methods were implemented for the purpose of this study. The descriptive statistics was applied to explore the socio-economic contribution of MSE. On the other hand, econometrics model was estimated to identify the main determinants of MSE.

Model estimation

Econometrics model is applied for identifying the different constraints of MSE. Following Evans (1987) the firm growth equation that relates firm growth to its initial size, age and other control variables can be specified as:

$$\frac{\ln S_t - \ln S_{t_0}}{A} = B_0 + B_1 \ln(S_{t_0}) + B_2 \ln(A_t) + \sum \beta_i X_i + U_t \quad (1)$$

Where:

S_t : Represents firm's current size, S_{t_0} : Represent firm's initial size, A : Represent firm's age

X : Represent other control variable, U : Represents the normally distributed error term with mean zero and a non-constant variance.

By incorporating the specific control variables in to equation (1), the firm growth equation estimated for this study is respecified as: Annual employment

$$\frac{\ln S_t - \ln S_{t_0}}{A} = b_0 + b_1 \ln S_{t_0} + b_2 \ln(A) + b_3 Li + b_4 \ln(Pre) + b_5 Educ + b_6 Bus + b_7 male + b_8 married + b_9 \ln(\text{age}) + b_{10} FC + b_{11} IC + b_{12} Sec + b_{13} Mkt \quad (2)$$

Where:

S_t : Current (survey time) size of the firm in terms of employment number, S_{t_0} : Initial size of the firm in terms of employment number, A : Age of the business (firm) in years, transformed in to logarithmic form, Li : Have license (the dummy takes 1 if it has license and 0 other wise), Pre : Previous experience of the owner by months, in logarithmic form, $Educ$: Education level of the owner (the dummy takes 1 if literate and 0 if illiterate), Bus : Business training of the owner (the dummy takes 1 if trained & 0 otherwise), $Male$: Owner male (the dummy takes 1 if the owner is male & 0 if it is female), $married$: Owner married (1 if the owner is married & 0 if it is not married), Age : Age of the owner in years, transformed in to logarithmic form, FC : Formal credit (the dummy takes 1), IC : Informal credit (the dummy takes 1), Sec : Sector (1 if the firm is on manufacturing and service sector and 0 if on trade), Mkt : Market area of the business (the dummy takes 1 if the firm located in traditional market area and 0 other wise)

Firm size is measured in terms of employment which represents the number of regular workers that comprised of working owners, paid workers and unpaid workers in the firm on a permanent base (Gebreyesus, 2007). It is also possible to estimate firm size in terms of sale, profits or fixed asset rather than employment but this may result some measurement errors. The errors probably emanated from lack of recalls (since most MSE do not keep records and unable to report their sales and profit accurately) and inflation (unlike to sales or fixed assets employment is not affected by inflation). Furthermore, most owners of MSE are not ready to tell the exact amount of sales and profit because of fear of taxation and hence, they underestimate their sales and profit.

The firm age is measured in years from the birth of the firm to the time of the survey. Apart from firm's initial size and age, other six major variables that might have some impact on the growth of the firm are considered. These are formality of the firm, human capital, demographic factor, access to finance, sector and market location. The summary statistics of these variables are depicted on [Table 1](#).

The firm is said to be formal if it has business license, the dummy business license takes 1 if the business has license and 0 otherwise. Human capital can be expressed in terms of owner's previous experience, education status and business training. Owner's previous experience measured in months and transformed in to logarithmic form. Education status of owners estimated by illiterate as reference and if the owner is educated the

dummy takes 1 and 0 if the owner is illiterate. Business training measured by the dummy 1 if the owner of the business trained and 0 otherwise (if it is not trained).

Demographic factor of the owner can be explained in terms of gender, marital status and owner's age. Gender is measured by the dummy 1 if the owner is male and 0 otherwise (if it is female). Marital status estimated by the dummy 1 if the owner is married and 0 otherwise (if it is not married). Owner's age measured in years but transformed in to logarithmic form. Access to finance measured by credit access variables, for the purpose of this study credit access variables broadly classified in to formal credit access from banks and MFI and informal credit access from trade credit, relatives/friends, family and own saving. Thus the two dummies would be having formal credit access and having informal credit access.

To capture the effect of sector on firm growth, the sector that MSE involved broadly categorized in to trade, manufacturing and service. Trade considered as a reference (control) and hence the dummy takes 1 if the sector is whether manufacturing or service and takes 0 if the sector is trade. In order to find out whether the location of the firm has an impact on firm growth or not, market location variable is introduced, market location refers to the location of the firm on traditional market area (around the main road and commercial district). Therefore, the dummy takes 1 if the firm is in traditional market area and 0 other wise.

The growth of the firm is calculated as the logarithmic difference between initial employment size and current employment size divided by the age of the business. This calculation might have some limitation because when we calculate size between two end points (initial and current size) the fluctuation in the middle time will be ignored (Gebreeyesus, 2007). The transitory fluctuations in size or transitory measurement errors in observed size could bias the growth regression (Davis, Haltiwanger, and Schuh, 1996 as quoted by Gebreeyesus (2007). But Gebreeyesus (2007) found no significant variation in the middle years for MSE of some selected towns of Ethiopia.

Table 1: Summary statistics of the main variables in the estimated model

Variables	Mean	Std Dev.
Annual employment growth from initial to current period (lnSt-lnSto)/age	0.004	0.838
ln(initial size)	1.058	1.082
ln(age of business)	1.285	1.252
Have business license	0.93	0.272
ln(previous experience, in months)	2.411	2.028
Education level of owner	0.9	0.327
Business training of owner	0.22	0.415
Male headed business	0.85	0.359
Owner married	0.75	0.435
ln(owner age)	3.474	0.297
Have formal credit access	0.28	0.451
Have informal credit access	0.76	0.429
Sector	0.59	0.494

Market area	0.58	0.492
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Source: Field survey

III. RESULTS AND DISCUSSIONS

1. The socio-economic contributions of micro and small enterprise

This study assessed the socio-economic contribution of MSE based on the potential to create employment opportunity and income generation.

Employment opportunity created by micro and small enterprise

As evidenced in [Table 2](#) trade, manufacturing and service sector generates 26%, 46% and 29% of employment opportunity, respectively. Manufacturing sector absorbs the highest share (46%) of the labour force which partly because the nature of the activity of manufacturing sector invites more labour force than trade and service sector. Interms of gender, the number of male (68%) higher than female (32%) (for the sake of saving space the data not reported here) and hence MSE creates more job opportunity for male than female.

Table 2: Employment opportunity by the type of sector and by gender (%)

Sectors	Male	female	Total
Trade	21	36	26
Manufacturing	57	21	46
Service	22	43	29
Total	100	100	100

Source: Field survey

From the surveyed sample, sole proprietorship and cooperative types of ownership is found. Sole proprietorship types of business employ more people (58%) than cooperative business (42%) ([Table 3](#)). That is why most business in the surveyed town (Wolkite town) is owned by an individual (which is sole proprietorship).

Table 3: Employment opportunity by the types of ownership (%)

Business ownership	Employment opportunity
Sole proprietorship	58
Cooperative	42
Total	100

Source: Field survey

The growth rate of employment opportunity can be observed by differentiating the timing of employment into employment at the start of the business and employment during the survey time in each respective sector. [Table 4](#) shows the employment growth rate in trade (19%), in manufacturing (9%) and in service (6%). On aggregate, employment opportunity grows

by 10.2% growth rate. Furthermore, the growth rate of employment in trade (19%) is higher than the rest sector which is partly because the trade sector has fewer barriers to enter and the most widely experienced activity in the surveyed town.

Table 4: Employment opportunity by the types of business ownership (%)

	Employment opportunity by sector			Total
	Trade	Manufacturing	Service	
Growth rate	19	9	6	10.2

Source: Field survey

As [Table 5](#) reveals the growth rate of employment opportunity can also be analyzed by the type of ownership. Accordingly, the sole proprietorship employment opportunity growth by 55%. On the other hand the cooperative employment opportunity declined by 21%. On aggregate, employment opportunity grows by 10.2% growth rate. The main reason for the decline in the number of employment in cooperatives types of business are the conflict among the members, lack of market access, shortage of raw materials, lack of managerial know how (skill), etc.

Table 5: Growth rate of employment opportunity by business ownership type (%)

	Employment by ownership type		Total
	Sole proprietorship	Cooperative	
Growth rate	55	-21	10.2

Source: Field survey

Income generated by micro and small enterprise

As evidenced in [Table 6](#) sectors varies in their income generation capacity. Trade, manufacturing and service sector on average generates 2,221.5 birr, 2,071 birr and 920 birr per month, respectively. Trade sector generates the highest income per month and the service sector generates the lowest income. These differences arises due to most citizens of the surveyed town relies their livelihood on trading activities.

Table 6: Average income generated by sector per month in birr

Sector	Income earned
Trade	2221.5
Manufacturing	2071
Service	920

Source: Field survey

There is also the difference in income generation capacity in terms of ownership type. As shown in [Table 7](#) sole proprietorship on average generates 3,697 birr income per month while that of cooperatives generates 1,515.5 birr and hence sole proprietorship generates the highest income which is twice the income generated by the cooperatives. This variation originates once again because the majority of the business owned by individuals (sole proprietorship).

Table 7: Average income generated by business ownership per month in birr

Business ownership	Income earned
Sole proprietorship	3,697
Cooperatives	1,515.5

Source: Field survey

2. Determinants of micro and small enterprises

[Table 8](#) reports the determinants of micro and small enterprises in Wolkite town. The model is estimated with robust standard error in order to avoid the problem of heteroscedasticity. The value of goodness-of-fit of the model as shown by pseudo R2 is 0.16. In order to verify the validity of the estimated model, statistical t-test is conducted (the sign ** shows a 5% significance level).

Table 8: Determinants of micro and small enterprises

Variables	Coefficients	Robust standard error	T-ratio	P-value
ln(initial size)	-0.057	0.113	-0.51	0.614
ln(age of business)	0.019	0.227	0.09	0.932
Have business license	0.022	0.306	0.07	0.943
ln(previous experience)	0.060*	0.026	2.30	0.024
Education level of owner	-0.094	0.127	-0.74	0.462
Business training of owner	0.201	0.497	0.40	0.687
Male owned business	0.388	0.344	1.13	0.263
Owner married	0.223	0.227	0.99	0.327
ln(owner age)	-0.362	0.166	-2.17	0.033
Have formal credit access	-0.252	0.349	-0.72	0.471
Have informal credit access	0.220	0.459	0.48	0.633
Sector	0.099	0.135	0.73	0.467
Market area	0.199	0.174	1.15	0.254

R-squared = 0.16
level of significance

*represent 5%

Source: Model estimation results

The following paragraph presents the discussion and interpretation of the influence of each explanatory variable in the estimated model:

Initial size and age of the firm

Initial size of the firm negatively affects firm growth but age of the business affects firm growth positively. Unlike other studies both are insignificant. The negative relationship between initial size and firm growth describes smaller firms grow faster than large firms which is consistency with previous case studies by Evans (1987), Liedholm (2001) and Gebreeyesus (2007). The positive relationship between firm age and firm growth shows the younger firm grows slower than the older one which is in contrast with similar previous case studies by Evans (1987), Liedholm (2001) and Gebreeyesus (2007).

Business formality

Formality of the business estimated by whether the business have license or not. There is a positive relationship between business formality (have license) and firm growth. Formal firms grow faster than informal ones. This is partly because formal firms (since they have legal document) have the better chance to engage on government programs such as public procurement, training, business development service and bank loans (Gebreeyesus, 2007). On the other hand informal enterprises face greater difficulties in obtaining formal credit and assistance from law enforcement agencies and courts. Furthermore such positive relationship is consistency with the previous studies by Nichter & Goldmark (2009) and Gebreeyesus (2007).

Experience

The previous experience of the owner has positive impact on firm growth and found to be significant. The business owner who has previous business experience can grow faster than owners with out previous experience which is also consistency with Nichter & Goldmark (2009) and Gebreeyesus (2007). Therefore, the government should give consultancy and other supports for MSEs to have some business experience before starting the operation of business.

Education

Education level of the owner has negative impact on MSE growth which is unexpected outcome (because education level is expected to promote MSEs growth and hence should positively affect firm growth). Education status of MSEs owner negatively affects the growth of the MSEs which implies education level may not as such significantly important for the growth of MSEs. The reasoning lies on the facts that for the operation of most MSEs do not require the application of advanced technology and technical skill or know how. Furthermore, the majority of interviewed in the survey respond that they are primary school educated and their education status is not the constraint to expand their business. However, using this specific survey result the benefit of education for the development of human capital (and hence firm growth) cannot be underestimated (education has the potential to promote basic human skills). The previous studies by Nichter & Goldmark

(2009) and Gebreeyesus (2007) indicate education level of the owner has mixed impact on the growth of the firm.

Business training

Business training positively affects the growth of MSE. This indicates MSE with business training can grow faster than MSE without such trainings. Specifically, business owners with access to business training have better managerial and entrepreneurial skills and their business become more successful and hence getting grown.

Demographic factors (gender, marital status and age of the owner)

Gender can influence the growth of the firm. Male owned firm and married owners positively affects the growth of the firm. Male headed firms grow faster than female headed firm but it is found to be insignificant. Furthermore, the descriptive part of the data also shows MSE creates more employment level (estimator of size in this study) for male than female. The existence of this difference partly because women apart from business activity, they are also busy at domestic activity (such as rearing children and carrying family) than male. This outcome is consistency with the study by Liedholm (2001), Gebreeyesus (2007) and Nichter & Goldmark (2009). On the other hand, owner age affects firm growth negatively

Access to finance

Formal credit access negatively while informal credit access positively affects firm growth. The negative empirical result of formal credit access (from banks and MFI) indicates that formal financial institutions are not the main source of finance because of collateral requirement, high interest rate and other unfavorable condition. Where as informal finance (such as traditional form of money mobilization or 'equib', loan from friends/relatives, etc) is the main source of business growth. This result is consistency with the study by Gebreeyesus (2007). Therefore, it is better for the growth of MSEs to formalize or transform this informal financial access in to formal one.

Type of sector

The type of sector on which MSE engaged in can affect the growth of firms. MSE engaged in service and manufacturing sector grow relatively faster than those engaged in trade sector and found to be significant which is consistency with the descriptive part of this study where manufacturing and service sector creates more employment level than the trade sector. Furthermore, this empirical result is consistency with the studies by Liedholm (2001), Gebreeyesus (2007) and Nichter & Goldmark (2009).

Location of the firm

The location of the firm can explain the growth of the firm. In this study the firm located at traditional market (road side and commercial district) positively affects the growth of the firm. The MSE located in traditional market area grows faster than MSE that located in non-traditional market area which is consistency with the studies by Liedholm (2001) and Gebreeyesus (2007).

IV. CONCLUSION

In this paper the socio-economic contributions and determinants of MSE analysed by using the survey of 100 samples in Wolkite town. MSE has socio-economic contributions such as employment opportunity and income generation. In terms of sector, manufacturing creates more job opportunity than service and trade sector. In terms of ownership type, sole proprietorship types of business employ more people than cooperative business which is because most business in the surveyed town is owned by individuals.

The growth rate of employment opportunity in trade sector is higher than manufacturing and service sector. On the other hand, the growth rate of employment in sole proprietorship business increases by 55% and that of cooperatives declined by 21%. The main reason for the decline of employment in cooperatives business are the conflict among the members, lack of market access, shortage of raw materials, lack of managerial skill, etc. In order to alleviate some of the constraints, training should be provided on book keeping and accounting systems, entrepreneurship and managerial skill development. MSE also have the potential to generate income, income generated by trade sector relatively higher than manufacturing and service. This difference arises due to the fact that most residence of the surveyed town relies on trading activities.

Even though MSEs have socio-economic contribution, there are some impediments that potentially affect the growth of MSE. Among some of the determinants are size and age of the firm, formality/informality of the business, business experience, education, business training and access to finance and the market location of the firm. Improving the regulatory environment could increase the number of firms operating formally, and in turn help enterprises to grow fast. Since there is no commercial business center in Wolkite town, the government should build business center at the different location of the town so as to partially avoid the problem of market access. Since MSEs are diverse in terms of

sectors and ownership types, they faces different kinds of constraints, for instance, MSE at start up stage may require working capital while MSE already in existence may require business training. Therefore, MSE at the different sector and ownership types requires various forms of assistance.

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To assess properties of Contrafeedant® under the brand name Onteem® in comparison with Market Standard Solo Azadirachtin formulation against *Spodoptera litura*

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Abstract- The aim of the present study is to depict the properties of Contrafeedant® formulation under the brand name Onteem®. This when applied on the plants, it distastes the insects from feeding on crop, make uncomfortable to oviposit and make insects unstable to hide in the plant canopy to get exposed to insecticides application. This can be integrated and used with chemical insect control, which can help & manage the insect population under economic threshold level of attack involving the good agricultural practices.

Index Terms- Contrafeedant, Azadirachtin, Micro emulsion formulation, non-ionic silicon polyether surfactant, *Spodoptera litura*

I. INTRODUCTION

India is primarily an agricultural driven country, because more than 60 percent of India's population depends upon agriculture and its allied activities for their source of livelihood. The increase in food production and food security with the ever-growing population is becoming very important in the present times. The changing climatic conditions, the new invasive insect attacks, disease epidemics and health hazards linked to pesticide usage have led the scientific community in search of sustainable, biological and green solutions for managing the pest populations. The current approach toward pest management is to combat the pest with an integrated approach. Thereby all methods of Integrated pest management are deployed to manage the pest population in a way that it does not easily develop resistance to the control measures. The below research is using one such component of Integrated pest management and focuses on the use of Contrafeedant® (Onteem®) to manage the insects on crops making them vulnerable to better control under integrated pest control approach.

II. EXPERIMENTATION

2.1 Material and Method

3rd instar larvae of *Spodoptera litura* were selected for this experiment. The experiment was conducted using 3 treatments

with 4 replications each. The selected larvae were kept in starvation for 12 hours. Market standard Azadirachtin was compared with Contrafeedant® (Onteem®). The Azadirachtin was used at the dose of 2 ml/Lit and Contrafeedant® (Onteem®) was used at the dose of 3 ml /Lit, an untreated control was also kept for comparison. The experiment was conducted via two methods.

1. Spray Method

In this method the, the test insects along with fresh castor leaves for feeding were sprayed with the stock solution Contrafeedant® (Onteem®) and Azadirachtin separately so as to make them come in direct contact with the molecules separately. Treated items were then transferred to magenta boxes.

2. Leaf Dip Method

The stock solution were made using the doses as mentioned in the treatment details. Freshly plucked leaves of castor were washed properly and then dipped in the respective solution for 5 – 10 min and allowed to shade dry for a while. They were then kept in Magenta boxes and 5 larvae were released in each of the boxes to assess the contrafeedant properties exhibited by the test sample.

Observations were taken at 6, 12 and 24, 48 and 72 hours after application.

2.2 Contrafeedant® (Onteem®) formulation comprises Azadirachtin along with calibrated amount of low molecular weight non-ionic silicon polyether surfactant, to form a more stable compound quickly enters in plant system induce insecticidal and distasteful properties in the plant system making insect attack significantly unstable.

When this formulation is diluted in water for application, then formed diluted formulation, comprises of multiple components, resulting to a solution, which is a micro-emulsion, and/or nano-suspension. These are advantageous ecofriendly formulations for delivering and performing chemical compounds effectively to the target as well as desired environment (e.g., crops, soil).

III. OBSERVATIONS

Table 3.1: Observation of Spray Method treatment

Treatment	(%) Percent Feeding				
	Spray Method				
	6 Hrs.	12 Hrs.	24 Hrs.	48 Hrs.	72 Hrs.
Contrafeedant® (Onteem®) @ 3 ml /Lit	8	12	25	40	55
Azadirachtin @ 2 ml/Lit	10	12	28	45	58
Control	35	45	85	95	100



Table 3.2: Observation of Leaf Dip Method treatment

Treatment	(%) Percent Feeding				
	Leaf Dip Method				
	6 Hrs.	12 Hrs.	24 Hrs.	48 Hrs.	72 Hrs.
Contrafeedant® (Onteem®) @ 3 ml /Lit	5	15	20	38	50
Azadirachtin @ 2 ml/Lit	8	18	25	44	59
Control	35	45	85	95	100



IV. RESULT AND DISCUSSION

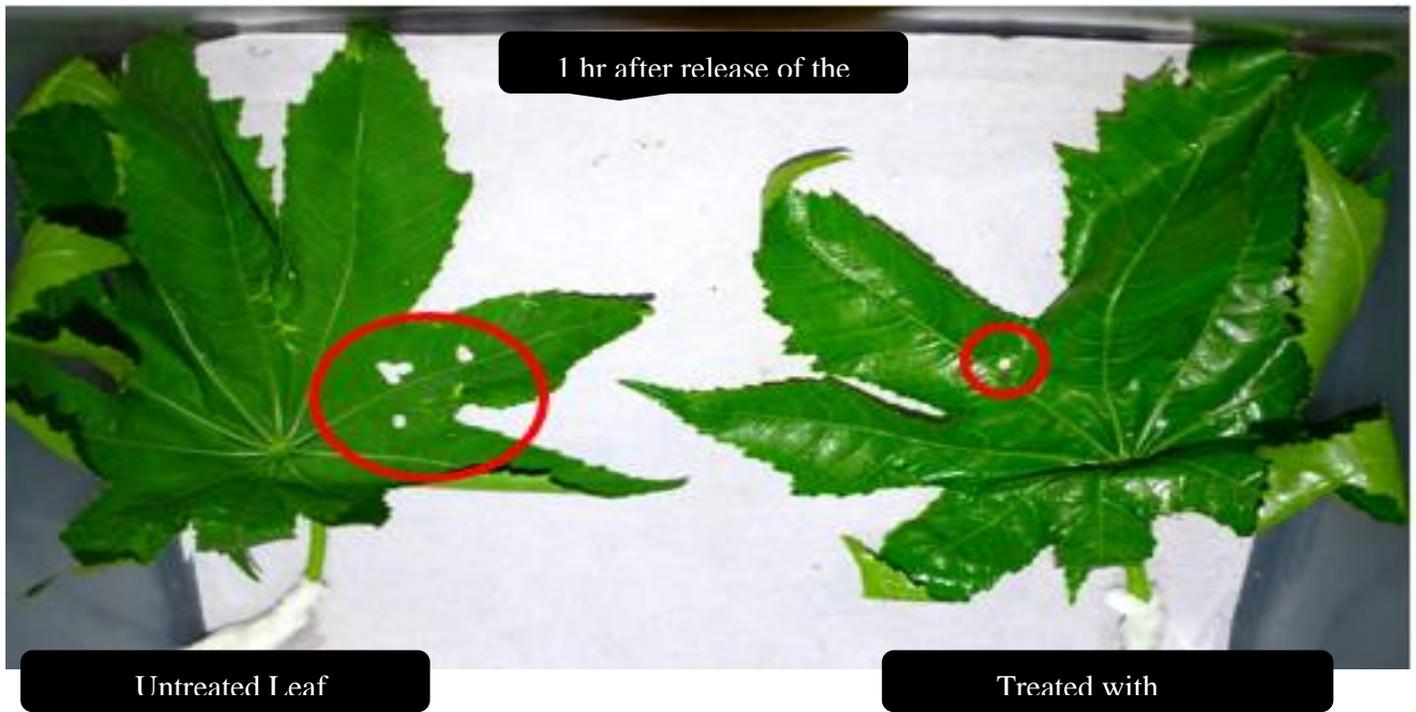
Study on Effect of Contrafeedant®(Onteem®) on Host Preference:



Spodoptera litura
larvae feeding on

Spodoptera feeding on castor leaves

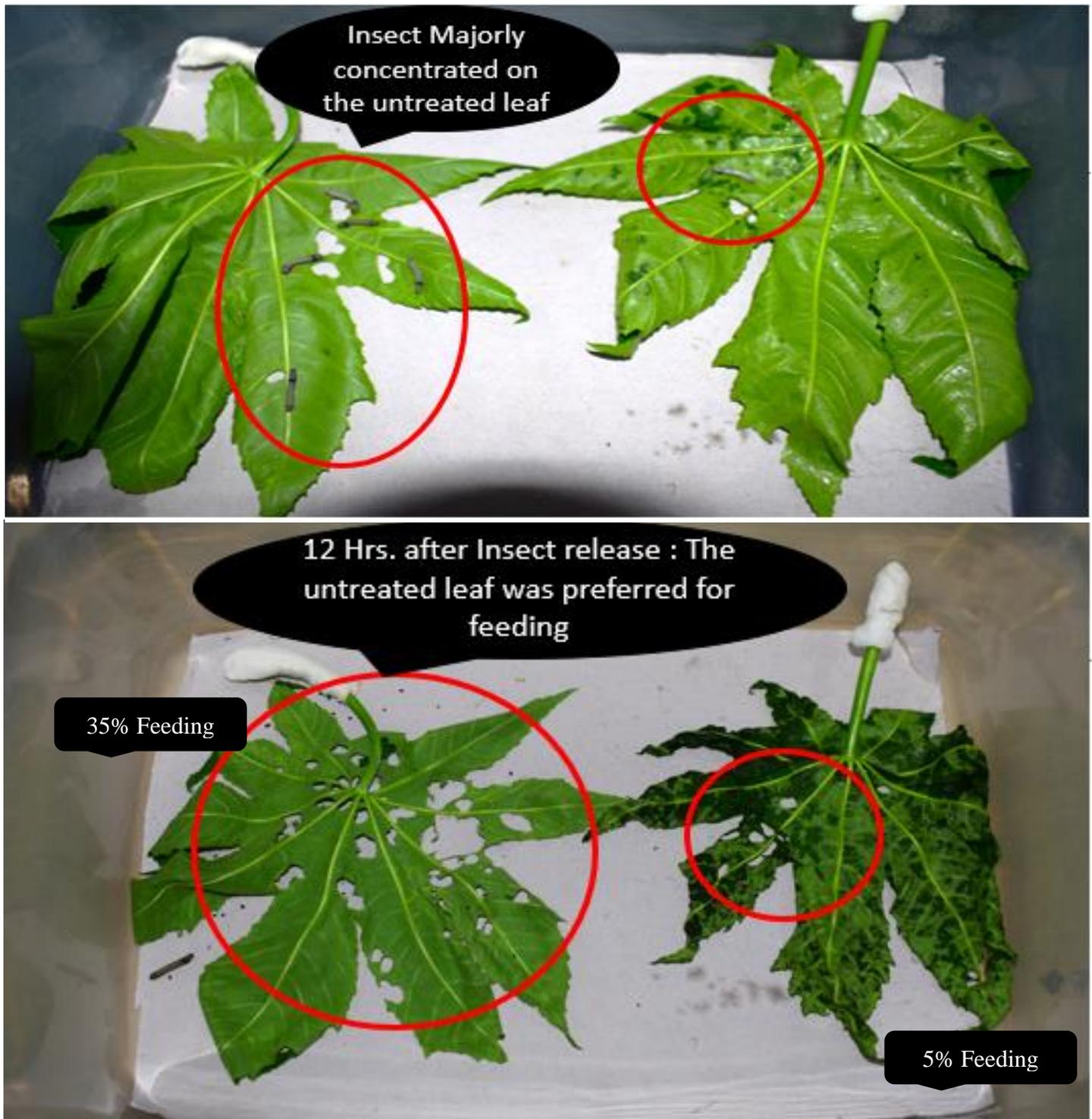
A study was also taken to Check the effect of the test sample on the eating preference of *Spodoptera litura*. For this a small experiment was set up, the experimental unit comprised of a leaf treated with **Contrafeedant**® (**Onteem**®) and the other leaf, fresh and untreated. 10 insects were released in each Experiment unit. The unit was then checked after 1hr, 6hrs, 12 hrs and 24 hrs.



1 hr after release of the

Untreated Leaf

Treated with



V. CONCLUSIONS

72 hrs after the experiment it was noticed, in all the treatments the maximum feeding to the tune of 100% was found in case of control. In case of Spray method, the maximum percent feeding observed after 72hrs of application was 55% in **Contrafeedant® (Ontem®)** treated and Azadirachtin treated 58% respectively.

The results were similar in case of the leaf dip method as well. The percent feeding observed after 72 hrs of application was 50% in case of Contrafeedant® (**Ontem®**) treated and 59% in Azadirachtin treated.

The host preferential study is also of the view that when given a choice the insect majorly concentrated feeding on the untreated leaf, contrary to the treated one. The untreated leaf showed 35% Feeding on untreated leaves as compared to only 5% feeding in the treated leaf.

All the insects used for the study were reared separately and assessed for any kind of morphological changes that may result due to exposure with the **Contrafeedant® (Ontem®)**. It was observed that the insect that came in contact with the **Contrafeedant® (Ontem®)** at recommended doses showed some significant morphological changes, such as abnormal morphology, delayed oviposition and emergence from pupae. Another significant observation was, the rate of oviposition was also drastically reduced. Thus, **Contrafeedant® (Ontem®)** in integration with chemical control can help manage the insect population involving the good agricultural practices.

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Characteristics of Anogenital Condyloma Acuminatum Patients with Human Immunodeficiency Virus (HIV) in Haji Adam Malik General Hospital January 2012 - December 2017 Period

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Abstract- Introduction : Condyloma Acuminatum (CA) is a sexually transmitted disease (STD) caused by Human Papilloma Virus (HPV) especially types 6 and 11, which can be found mainly in 90-95% cases. Clinical features may be papillomatous papules or nodules found on the mucous membrane or skin of the external genitalia, perineum and anus. It is transmitted through sexual contact, both genito-genital, oro-genital and genito-anal.

Objective : To understand the characteristics of anogenital condyloma acuminatum patients with HIV in the Department of Dermatology and Venereology, Divison of Sexually Transmitted Diseases Haji Adam Malik General Hospital Medan during the period of 1st January 2012- 31st December 2017.

Subjects and methods : Subjects were the patient's medical record data in Department of Dermatology and Venereology Haji Adam Malik General Hospital Medan from 1st January 2012 – 31st December 2017 using descriptive retrospective method.

Results : Patients with condyloma akuminatum with HIV was 39 people, found the most in the age group 26-35 years was 16 people (41.0%), male sex was 34 people (87.2%), at the perianal location was 21 people (53.8%) , giant form was 15 people (38.5%), in the homosexual group was 17 people (43.6%), with the number of sexual partners more than 1 was 28 people (71.8%), with a CD4+ 500-200 was 19 people (48.7%).

Conclusion : The number of condyloma akuminata patients with HIV in Haji Adam Malik General Hospital from 1st January 2012 to 31st December 2017 was 39 people, most in the age group 26-35 years, male sex, perianal location, giant form, homosexual group, number of sexual partners more than 1, CD4+ 500-200 count.

Index Terms- condyloma acuminatum, HIV, characteristics

I. INTRODUCTION

Condyloma Acuminatum (CA) is a sexually transmitted disease (STD) caused by Human Papilloma Virus (HPV) especially types 6 and 11, which can be found mainly in 90-95% cases. CA is also called genital warts, chicken's comb, venereal warts, genital warts, anogenital warts. Clinical features may be

papillomatous papules or nodules cauliflower-like found on mucous membrane or skin of external genitalia, perineum and anus. It is transmitted through sexual contact, both genito-genital, oro-genital and genito-anal.^{1,2,3}

The prevalence of CA is estimated at 1% in the sexually active population. The prevalence of CA is increasing in European countries. In the UK in 1996-2005, the prevalence of CA increased by around 25%. In 2008, the total surveillance data of CA cases was 2,276 in Hong Kong.⁴ Data on CA medical records at the Haji Adam Malik General Hospital Medan in 2008-2011 was 76 people.⁵ While in 2011-2015 there were 104 cases.⁶ The prevalence of HPV infection is high among sexually active homosexual, with the anal canal being the most common site of infection.⁷

The prevalence of HPV infection increases in patients with immunosuppression, such as in Human Immunodeficiency Virus (HIV) infections, immunosuppressive therapy and pregnancy with longer manifestations and difficult viral clearance so that they become persistent infections.. These conditions will also cause the development of condyloma akuminata lesions become longer, easy to relapse, and bigger (giant condyloma).¹

CA associated with HIV, it is known that there is a decrease in Langerhans cells, T cell lymphocytes, macrophages, neutrophils, and natural killer cells in patients infected with HIV that cause changes in local immunity and an increase in HPV infection in tissues. HIV infection is a predisposition that increases the incidence and transmission of CA that caused by HPV.^{8,9}

A study conducted in Manado, the distribution of CA patients based on comorbids, HIV was the most comorbid with a number of 3 people (11.11%).⁵ Whereas in the retrospective study conducted in Surabaya, the number of CA patients with HIV increased from 2011-2014. In 2011 there were 8 people (0.78%), in 2012 there were 7 people (0.79%), in 2013 the number increased by 13 patients (1.26%) and there were 35 people (3.09%) in 2014.¹⁰

Because there is still little information and there are no studies on the characteristics of CA patients with HIV, besides Haji Adam Malik General Hospital Medan as a central hospital that has a special service clinic for HIV patients, researchers are interested in examining the characteristics of anogenital CA

patients with HIV in Haji Adam Malik General Hospital Medan in a period of 6 years (2012-2017) includes the number, age group, sex, shape of the lesion, location of the lesion, sexual orientation, number of sexual partners, and CD4 + count.

II. METHODS

This study was descriptive retrospective. This study was conducted by looking at and re-recording medical record data from patients at the Department of Dermatology and Venereology, Division of Sexually Transmitted Diseases Haji Adam Malik General Hospital Medan from 1 January 2012 to 31st December 2017.

III. RESULTS

The number of CA in anogenital patients accompanied by HIV who came for treatment at the Dermatology and Venereology Polyclinic Haji Adam Malik General Hospital Medan from 2012 to 2017 based on medical record data in the Haji Adam Malik General Hospital in Medan which qualified for the study was 39 people.

TABLE 1. FREQUENCY DISTRIBUTION BASED ON AGE		
Age group	n	Percentage (%)
17-25 year	14	35.9
26-35 year	16	41.0
36-45 year	7	17.9
46-55 year	2	5.1
Total	39	100

KA infection usually occurs during the active sexual period was 1% and there is a possibility of a tendency to change sexual habits and changing or adding partners in this age group which has a role in increasing the prevalence of HPV infections, especially CA.¹¹

According to the AIDS Commission in 2007, it is important to pay attention to the age distribution, because the younger the person's age, the more vulnerable to be infected by STD infections. In the age group of men between 20-34 years and women between 16-24 years are classified as high risk for STD infections.¹²

TABLE 2. FREQUENCY DISTRIBUTION BASED ON GENDER		
Gender	n	Percentage (%)
Man	34	87.2
Woman	5	12.8
Total	39	100

Men who suffer from CA accompanied by HIV in this study are the majority of men who have sex with men (MSM) anogenital. While women who suffer from CA accompanied by HIV are usually caused by having sexual relations with a partner who has the same disease that is CA accompanied by HIV.

TABEL 3 FREQUENCY DISTRIBUTION BASED ON LOCATION

Location	n	Percentage (%)
Genital	11	28.2
Perianal	21	53.8
Anogenital	7	17.9
Total	39	100

Based on the literature, anorectal lesions are usually affect homosexual men who are infected with HIV. Prevalence and recurrence rates of anal condyloma are much higher in individuals with impaired immune system compared with healthy individuals.^{13,14}

TABEL 4 FREQUENCY DISTRIBUTION BASED ON LESION SHAPE

Lesion shape	N	Percentage (%)
Acuminata	12	30.8
Keratotic	3	7.7
Papule	9	23.1
Giant	15	38.5
Total	39	100

Based on the table above, the most common form of lesions found in patients with CA accompanied by HIV is the giant form with 15 people (38.5%).

The prevalence of HPV infection increases in immunosuppressed patients, one of which is HIV infection with longer manifestations and difficult viral clearance, so that they become persistent infection. These conditions will also cause the development of CA lesions to be longer, easy to relapse, and larger (giant condyloma).^{1,15}

TABEL 5 FREQUENCY DISTRIBUTION BASED ON SEXUAL ORIENTATION

Sexual Orientation	n	Percentage (%)
Homosexual	17	43.6
Heterosexual	14	35.9
Bisexual	8	20.5
Total	39	100

Based on the table above, the most sexual orientation in CA people with HIV are homosexuals as many as 17 people (43.6%).

This is consistent with the literature that KA with anorectal lesions usually affects homosexual men with HIV infections. The prevalence and recurrence rates of perianal condyloma are much higher in individuals with impaired immunity compared to healthy individuals.^{11,12}

TABEL 6 FREQUENCY DISTRIBUTION BASED ON SEXUAL PARTNER

Sexual partner	n	Percentage (%)
1 person	11	28.2
>1 person	28	71.8
Total	39	100

Based on the table above, the most patients with sexual partners were >1 person as many as 28 patients (71.8%). Based on the table above, the highest CD4 + counts are 500-200, as many as 19 people (48.7%), followed by CD4+ 200-50 counts was 11 people (28.2%), CD4+ 750-500 was 5 people (12.8%), CD4+ 50-0 was 3 people (7.7%) and CD4+ 1000-750 was 1 person (2.6%).

TABEL 7 FREQUENCY DISTRIBUTION BASED ON CD4 COUNTS		
CD4+ (sel/ μL)	n	%
1000-750	1	2.6
750-500	5	12.8
500-200	19	48.7
200-50	11	28.2
50-0	3	7.7
Total	39	100

CD4 + examination is related to the manifestation of disease events in HIV patients.¹⁰ A review by Thappa and colleagues, the underlying HIV/AIDS factor can increase the incidence of CA, which is 5% - 27%.¹⁶

IV. CONCLUSION

Based on this study, condyloma akuminata patients accompanied by HIV from January 2012 - December 2017 in Haji Adam Malik General Hospital, found most in the reproductive age group of 26-35 years was 41.0%, male sex was 87.2%, at the perianal location was 53.8%, shape giant was 38.5%, in the homosexual group was 43.6%, with the number of sexual partners more than 1 was 71.8% and CD4+ 500-200 cells / μ L was 48.7%.

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Children's Language Development Through the Storytelling Methods of Picture-Card Media

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Abstract- The purpose of this research is to describe the development of children through the storytelling method of picture-card media. The child's development is the ability to speak. Research methods use quantitative research with quasi experiments. The population is kindergarten students aged 5-6 years. Data collection techniques using observation guidelines with an indicator of the ability of the child can answer questions of characters and characters in the story and the child can continue some of the stories listened to. Data analysis techniques using one-way variance analysis test. The results showed that the value of F_{count} 5.167 with a significance of 0.026, meaning that children's development for the ability to speak is influenced by the storytelling method of picture-card media.

Keywords- *children's language development, storytelling methods, picture-card media, kindergarten children*

I. INTRODUCTION

Early childhood developments include the six aspects of religious and moral values, physical-motor, cognitive, language, social-emotional, and the arts mentioned in regulation of the Minister of National Education number 137 year 2014 on national standards Early childhood education [1].

Basically, early education includes all the efforts and actions undertaken in the process of care, parenting and education in children by creating an environment where the child can explore his or her learning experience. It is this environment that gives the child the opportunity to know and understand something through the way of observing, imitating and experimenting repeatedly and involving all its potential intelligence.

Language is a means of communication and plays an important role in various lives. People not only think of using brains but also need language as the media of delivery. A good language disclosure through verbal and writing will help others understand how to think. Language gives a role in the development of early childhood into the whole person. According to Vygotsky (in Susanto, 2017:73) A language other than giving concepts and categories to think, language is also a tool for expressing ideas and asking questions [2].

The development of early childhood language skills is influenced by activities related to science, mathematics, music, social and other activities that can provide opportunities in early childhood. According to Yus, early childhood intelligence is his ability to express ideas about him and understand others and to learn new vocabulary or other languages [3]. A variety of spoken languages and a variety of writing languages is the language used in everyday life. The first language to be ruled

by early childhood is an oral variety or can also be called an oral language skill. Hearing and listening are the process of learning to speak naturally and through the process children learn to speak [4].

The results of the research conducted by Farihah (2015), the increase in the ability to speak children through the method of storytelling with the image media [5], it is also in line with the research results Maharani (2014) that there is influence of media storytelling method Picture card to the ability to know the literacy of children [6], as well as the research result of Asih (2011) that there is an increase in children's language skills through picture card media [7].

Speaking is a productive language skill: the delivery of thoughts, creative ideas, and opinions can be done with a person's speaking ability. The development of speech is a process that uses expressive language to form meaning. The study of developmental speech in the child is not separated from the fact that the speed difference in speech, as well as the quality and quantity of children in producing language. This is in line with the research Masfiah (2013), that the display of the word card media is one of the media that can be used to improve the ability to speak child group B in kindergarten [8].

According to Harris & Sipay that at the age of 5-6 years, the child can understand about 8000 words, and in the next year the child's ability can reach 9000 words [9]. This is reinforced by indicators of achieving children's language development in the Ministry of Education and Culture regulation of the Republic of Indonesia number 137 year 2014 on national standard for Early childhood education [10], that the level of development achievement Children's language of expressive language and demonstrate expressive language skills (expressed verbal and non-verbal language) in children aged 5 to 6 years are: (1) answering more complex questions, (2) mentioning the group of images Having the same sound, (3) communicating orally,

having a vocabulary, as well as identifying symbols for the preparation of reading, writing and Counting, (4) composing a simple sentence in a complete structure (sentence-predicate matter) , (5) Have more words to express the idea of others, (6) continuing some of the stories or fairy tales that have been listened to, (7) demonstrating the understanding of the concepts in the storybook. Research conducted by Oktavia (2018), that there is influence of the use of Image card media to the development of speaking children aged 5-6 years [11], as well as research Sholihah (2015), gained that the existence of an increase in the skills Talking child through the media picture card in the child group A [12].

The appropriate method for early childhood learning can be applied in kindergarten in particular to stimulate the development of early childhood language according to the level of its linguistic development. (a) The method of storytelling, (b) The method of conversation, (c) Question and answer method, (d) The method of demonstration, (e) The socio method of play/role-playing, (f) method of assigning assignments, (g) Methods of tourism works, Learning methods are designed in meaningful and fun play activities for children. This is as stated in regulation of the Minister of Education and Culture of Republic of Indonesia number 146 year 2014 [13], Appendix IV to Curriculum 2013 Early Childhood Education Learning Guidelines [14].

From some of the early childhood learning methods mentioned above, it is very clear that the storytelling method is one of the methods that will be researched to achieve the level of development of early childhood languages. Aspect of early childhood language development in kindergarten institution can be reached by one method that is method of storytelling. The storytelling method can be implemented by conducting storytelling activities in the learning process. According to Musfiroh, the method of storytelling is a way used by teachers in learning, according to the basic

purpose of children's language skills [15]. The use of storytelling methods can be applied to all aspects of development contained in the content of the PAUD curriculum [16].

Researchers use visual media, especially through picture cards for children, image card media can be a link between the child's imagination and the real world through the presented images and can stimulate the child's memory of the experience. Before so from the picture card media presented this child can speak to the teacher that the experience of the previous child is similar to that of the story presented so it can be said that the picture card can be presented to Children and can be used to stimulate the development of children's language in particular speaking.

There are visual emblems to clarify the verbal emblem to make it easier for children to understand the meaning of the message conveyed in learning, because visualizations depict the nature of a message in a form that resembles the actual state of [17].

With regard to the problem that the ability to speak as well as part of the child's language development is important then researchers are interested in describing the development of children's language through the storytelling method of media drawing cards.

II. IDENTIFICATION, RESEARCH AND COLLECT IDEA

This research uses the quasi experiment with non-equivalent control group design. There are 2 experimental groups and 2 control groups. The experimental group is given a learning treatment with the storytelling method of image card, while the learning control group is without the storytelling method of image card media. Measurement of observations conducted before and after learning using the rating scale calculation 1-4. Scale Rating is a scale used to collect raw data in the form of

numbers that are then interpreted in a qualitative sense [18]. The scale Rating used refers to the following table 1:

Table 1. Research Instrument Assessment [19]

Score	Description
1	Undeveloped
2	Start Growing
3	Evolving as expected
4	Excellent growth

The following observation grids are as follows:

Table 2. Speech Ability Indicator Grid Observation Instruments

Development Achievement Level	Indicator	Item Statement
Demonstrate understanding of concepts in storybook	Remembering story titles	1. Mentioning the title of the played story.
		2. Mentioning the characters in the story.
		3. Mentioning character characters in the story.
	Understand the content of the story	4. Mentioning events in the story.
Continuing some stories/that have been heard	Retelling the content of the stories that have been heard	5. Tell the storyline in sequence.
		6. Retelling the content of the story correctly and completely.

III. RESULT OF FINDINGS

Results of the observation that the influence of the storytelling method of media card to the

development of language in terms of speaking children aged 5-6 in Sidoarjo District Sidoarjo. The second hypothesized acceptance in research is seen from the average value of the development of language in terms of speaking in the control group of 3.266 which means growing well while the average value of language development in terms of speech in the experimental group of 3,533 meaning it develops very well, it proves that there is a significant influence between the storytelling method of image card media to the development of languages in terms of speaking at kindergarten Group B in District Sidoarjo Sidoarjo Regency.

As a proof of whether the storytelling method of the media card has an effect on the development of the child's responsibilities, then a test of one way ANOVA (Analysis of Variance), in this case the data analyzed is Post test data on the experiment Group and Control group. According to the test of one way ANOVA (Analysis of Variance) obtained the value of $F_{count} = 5.167$ and a value of 0.026, it proves that there is a significant influence between the storytelling method of image-card media to the development of languages in terms of listening and speaking at the kindergarten group B in District Sidoarjo District Sidoarjo.

The method of telling the story of a picture card that has been applied to kindergarten children aged 5-6 years in the District Sidoarjo District Sidoarjo affects the development of language in terms of children's talk include (1) mention the title of the story that has been heard ; (2) Mentioning the figures in the story; (3) mentioning character in the story; (4) Mentioning the events in the story; (5) Tell the storyline in sequence; and (6) retelling the content of the story correctly and completely.

Bromley stated that despite the difference in language-speaking speed in children, the components in the language did not change [20]. These components consist of phonology, morphology, syntactic, semantics and pragmatic. In line with Bromley, Otto argues that the development

of the phonology is concerned with the growth and production of sound systems in the language, resulting from babies born to the age of one. The vocal phoneme was first outspoken than a consonant phonemes. Morphological developments related to the growth and production of the meaning of the language, for example children who are still young say "mam" which means to eat. The development of syntactic is a meaningful word production and is in accordance with the rules that result in complete thought and sentence. The child experimented with syntactic since the first six years of development.

The ability of the child continues to evolve characterized by the seemingly apparently question word: what, who, why, where and how. Semantic developments occur at slower and longer speeds than children's development in understanding phonology, morphology and syntax. Semantic developments begin when the child is nine to twelve months old, when the child uses verbs, nouns and as a child develops using adjectives or adverbs [21]. Pragmatic developments relate to the use of language in expressing the interest and intent of a person to achieve the expected objectives. Since children are still early, when the child is still using one word, the child has already involved a Pragmatics component in order to achieve [22].

This is in line with the research results of the Penthiernitasari (2017) that the method of storytelling with the image media affects the ability to speak early childhood [23]. It is also in line with the research results of Sanura (2018) that the use of picture card media can develop the ability to tell the children of early childhood [24]. It is also in accordance with the results Yhuaningsih (2010) that the use of the image card media by means of showing the object/objects will facilitate, motivate, and attract the child in the development of language, especially the establishment of speech [25]. Similarly, the research results of Wijayanti (2017) that there is an increase in the ability to speak

through a method of storytelling with the image card Media [26].

Based on the above research, it can be concluded that the method of storytelling in media pictures can develop language development in terms of speaking children aged 5-6 years in Sidoarjo District Sidoarjo and proves the influence of Significant between the storytelling method of the media card to the development of language in terms of speaking in the children's nursery B group in Sidoarjo district Sidoarjo.

IV. CONCLUSIONS

Based on the research that has been conducted and test the difference with the Analysis of Variance (ANOVA), it was concluded that the development of the child in this case the ability to speak is influenced by the storytelling method of drawing cards in the kindergarten Group B Sub District Sidoarjo Regency.

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Determinants of Banking Performance of Licensed Specialised Banks in Sri Lanka: A Time Series Analysis

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Abstract- Financial sector plays a vital role for the economic development of a country. Stability of banks is vital for a profitable and healthy financial system of the country since they provide funds for investment by controlling funds from savings to productive uses for money. Licensed Specialised banks (LSB) operating in Sri Lanka are mainly engaged in lending for national development projects and lending in regional level but legalized to limited engagements in foreign exchange. The present study was carried out to model the determinants that mostly affect the banking performance of LSBs operating in Sri Lanka. Secondary financial data was collected from Central Bank of Sri Lanka and Time Series data was analyzed using Eviews software. Banking performance was measured through the variables, Return of Assets (ROA) and Return of Equity (ROE) modelled via fitting relevant Time Series models. The results show that ROA and ROE can be significantly modelled with Loan Quality, Efficiency and Capital Adequacy ratio. It was found that performance of LSBs in Sri Lanka depends on the factors Loan Quality, Efficiency, Capital Adequacy ratio and Loan Quality.

Index Terms- Banking Performance, Licensed Specialized Banks, Time Series,

I. INTRODUCTION

A time series is a collection of observations over a specific time period. Time series analysis should account for the internal structure (such as autocorrelation, trend or seasonal variation) of the data obtained and should use the structure to forecast future values of the series [1]. Some important characteristics to consider when first looking at a time series are data trends, seasonality, outliers, long run cycles and constant variance [2]. According to these characteristics, one can try fitting time series regressions such as Autoregressive moving average (ARMA) models, Autoregressive integrated moving average (ARIMA) models, Vector autoregression (VAR) models, Autoregressive conditional heteroskedasticity (ARCH) models... etc [2].

The banking sector of Sri Lanka consists of Licensed Commercial Banks (LCBs) and Licensed Specialised Banks (LSBs) [3]. As the end of 2014, it was found that 58% of total assets of financial system is accounted by the banking sector of Sri Lanka [4]. Banks play a critical role within the Sri Lankan financial system, as they are engaged in provision of liquidity to the entire economy, while transforming the risk characteristics of assets [3]. Banks facilitate all parties to carry out their financial businesses [5]. But banks can create weakness in financial system through mismatches in maturity of assets and liabilities and their interconnectedness [4]. Thus, the soundness of banks is highly important since any failure will affect the economy of Sri Lanka [6].

The main difference between Licensed Commercial Banks (LCBs) and Licensed Specialised Banks (LSBs) is that LCBs are legalized to accept demand deposits from the public (i.e. operate current accounts for customers) and they are authorized dealers in foreign exchange which enables them to engage in a wide-range of foreign exchange transactions, whereas LSBs are legalized to limited engagements in foreign exchange with Central Bank's approvals [7]. However LSBs are permitted to accept savings and time deposits on which interest is paid by the bank [7]. At present, there are 7 LSBs operating in Sri Lanka [3]. Some of them are national level banks while the rest are regional level banks. Banks which operate at national level engage in long term lending for development projects while banks which operate at regional level mainly engage in short term lending [7].

Banking performance is usually measured through a combination of financial ratios like Return of Assets (ROA) and Return of equity (ROE) since investment opportunities are mostly visible through financial analysis measuring various aspects of the performance [8].

Studies that have been carried out on banking performance in various countries have shown that Capital Ratio [9], size [9] and Liquidity [9] have positive impact and Activity Mix [9] and Overhead Expense Management [9] and Interest Rate [10] have negative impact on banking performance.

Results from a study on factors affecting performance of commercial banks in Uganda yielded Capital

Adequacy, Credit Risk/Loan Quality and Management Inefficiency are having a significantly negative impact on ROE while Interest Income are having a significantly positive impact on ROE [11].

Banking performance measured through ROA is negatively affected by Liquidity [10][12], Operating Cost [10], Capital Adequacy Ratio (CAR) [11][12], Credit Risk/Loan Quality [11], Management Inefficiency [11], whereas ROA is positively affected by Size [10][13], Interest Income [11], Annual Inflation Rate [11].

Capital Adequacy Ratio [8][11][14][15][16][17][18], Operating Efficiency [14], GDP [14][19], Asset Quality [15], Liquidity [20], Management Efficiency [15][21], Cost Income Ratio [19][22], Size [16][17][19], Interest rate risk (Net Interest Income/Total Asset) [23], Liquidity risk (Total Deposit/Total Asset) [23], Capitalization risk (Equity/Total Asset) [23], Credit Risk [11][18][23], Diversification [23][21], National Income [23], Loan Loss Provision to Total Assets [24] and Inflation rate [24] have significant impact on ROE.

Further, previous studies suggests that Capital Adequacy Ratio [8][11][12][15][18], IETTL (Interest Expense over Total Loans) [8], NIM (Net Interest Margin) [8], Asset Quality [15], Management Efficiency [11][15][21], Inflation [11][15][25], NPL(non-performing loans) [19], Size [10][18][19], Liquidity [20], Ownership [19], Credit Risk [11][18][23], Diversification [21][23], GDP [18], National Income [23], Loan Loss Provision to Total Assets [24], Total Overhead Cost to Total Assets [24] also substantially affect ROA.

In accordance to the literature, the study was carried out to determine the factors affecting banking performance of Licensed Specialised Banks after the end of civil war in Sri Lanka. Time series analysis was done considering many independent variables while taking ROA and ROE as independent variables measuring the banking performance. Many time series models were tried and the models which didn't satisfy the assumptions of the specific model were rejected without reporting. Models satisfying the assumptions are compared to choose the best fit and significant factors affecting banking performance of LSBs in Sri Lanka are identified from those models.

II. METHODOLOGY

Financial data of Licensed Specialized banks was collected from the library of Central bank of Sri Lanka for the period of 2008 to 2017 quarterly. The initial literature review suggested that the performance of LSBs are measured through Return of Assets (ROA)

and Return on Equity (ROE) and many factors affect the performance of a bank.

By a thorough literature survey, the following independent variables were identified. Capital Adequacy Ratio (CAR), Current & Savings deposits to total deposits (CASA), Cost Inefficiency (CI), Efficiency Ratio (EFF), Liquidity (LIQ), Loan Market Competition (LMC), Loan Quality (LQ), Market Profit Opportunity (MP), Net Interest Margin (NIM), Non-performing Advances Ratio (NPL), Provisions Coverage Ratio (PCR), Credit Risk (RISK), Total Assets (TA), Total Loans and Advances to Total Assets (TLTA).

Values for all considered variables were calculated using standard formulas. The data were analysed using EViews (version 10) software for the above variables taking ROA and ROE as dependent variables.

Initially the Granger causality test [26] was used to determine whether one time series is useful in forecasting another. Granger Causality test checks the following hypothesis.

H_0 : The variable x does not Granger Cause the variable y Versus

H_a : The variable x Granger Cause the variable y

The variables which does not Granger Cause ROA and ROE were removed from further analysis.

Then for the selected variables, unit root test was done to check whether the variables are stationary at level, 1st difference and 2nd difference. Also, the correlogram was checked. Unit root test checks the following hypothesis.

H_0 : The series is not stationary
Versus H_a : The series is stationary

Different time series regression models were fitted and residual analysis for each model was done. From all the significant models, a comparison was done to find the best fitted model for the data.

The fitted models had general formats as follows.

1. $ROA_t = \mu_0 + \mu_1 ROA_{t-1} + \mu_2 ROA_{t-2} + \sum_{i=1}^n \alpha_i x_{it} + \sum_{i=1}^m \beta_i x_{it-1} + \sum_{i=1}^l \gamma_i x_{it-2} + \varepsilon$
2. $lgROA_t = \mu_0 + \mu_1 lgROA_{t-1} + \mu_2 lgROA_{t-2} + \sum_{i=1}^n \alpha_i x_{it} + \sum_{i=1}^m \beta_i x_{it-1} + \sum_{i=1}^l \gamma_i x_{it-2} + \varepsilon$
3. $ROE_t = \mu_0 + \mu_1 ROE_{t-1} + \mu_2 ROE_{t-2} + \sum_{i=1}^n \alpha_i x_{it} + \sum_{i=1}^m \beta_i x_{it-1} + \sum_{i=1}^l \gamma_i x_{it-2} + \sum_{i=1}^l a_i x_{it-3} + \sum_{i=1}^l b_i x_{it-4} + \varepsilon$

$$4. \lg ROE_t = \mu_0 + \mu_1 \lg ROE_{t-1} + \mu_2 \lg ROE_{t-2} + \sum_{i=1}^n \alpha_i x_{it} + \sum_{i=1}^m \beta_i x_{it-1} + \sum_{i=1}^l \gamma_i x_{it-2} + \sum_{i=1}^l a_i x_{it-3} + \sum_{i=1}^l b_i x_{it-4} + \varepsilon$$

Where,

ROA - Return of Assets

ROE - Return of Equity

lgROA - logarithmic of ROA

lgROE - logarithmic of ROE

x_i – independent variables including Loan Quality (LQ), Efficiency (EFF) and Capital Adequacy Ratio (CAR).

ε – error term

$t = 2008 Q1, 2008 Q2, \dots, 2016 Q4$

$\mu_i, \alpha_i, \beta_i, \gamma_i, a_i, b_i$ - coefficients of various independent variables.

The objective of this study was to find the determinants affecting banking performance of Licensed Specialised Banks in Sri Lanka. Based on the objective, the above models were tried using EViews software to conclude the following research hypotheses.

H_0 : There is no significant impact of independent variable to performance of Licensed Specialised Banks in Sri Lanka Versus

H_a : There is a significant impact of independent variable to performance of Licensed Specialised Banks in Sri Lanka

A time series regression assumes the residuals are normally distributed with zero mean, constant variance and independent. Residual analysis was done to determine whether the fitted models satisfy the assumptions for residuals. Hypotheses used in residual analysis are given in table 1.

Models with residuals normally distributed and mean around zero with low skewness, low AIC, SIC values, kurtosis around 2 were selected as best models for ROA and ROE measuring banking performance of Licensed Specialised Banks of Sri Lanka.

Table 1: Hypothesis used in residual analysis.

Residual Analysis	Hypothesis used
Randomness of residuals - Correlogram	H_0 : Residuals are random Versus H_1 : Residuals are not random.
Normality of residuals	H_0 : Residuals are normally distributed Versus H_1 : Residuals are not normally distributed.
Constant variance of residuals - White Test for Heteroskedasticity	H_0 : Residuals are not heteroskedastic (Constant variance of residuals) Versus H_1 : Residuals are heteroskedastic
Residuals are serially correlated - Breusch-Godfrey Serial Correlation LM Test	H_0 : Residuals are not serially correlated Versus H_1 : Residuals are serially correlated

III. RESULTS AND DISCUSSION

Using pairwise Granger Causality test shown below, it was found that LQ, EFF and CAR Granger Cause ROA and ROE. LQ Granger Cause ROE at lag 1.

Table 2: Table of probabilities resulted by Granger Causality Test.

	Does not Granger Cause				
	ROA	ROE	LQ	CAR	EFF
ROA		0.325	0.004	0.018	0.870
ROE	0.684		0.004	0.021	0.702
LQ	0.006	0.123		0.134	0.967
CAR	0.002	0.017	0.437		0.58
EFF	0.024	0.009	0.083	0.631	

As per results from Granger Causality Test, LQ, EFF and CAR variables were chosen as independent variables of the study as the variables Granger Cause ROA and ROE. Using unit root test, the stationarity of all variables was checked at level, 1st difference and 2nd difference and the results obtained were summarized as follows.

Table 3: Table of stationarity of the variables.

Variable	Level	1 st difference	2 nd difference
ROA	Non-stationary	Non-stationary	Stationary
ROE	Non-stationary	Stationary	Stationary

CAR	Non-stationary	Stationary	Stationary
LQ	Stationary	Stationary	Non-stationary
EFF	Non-stationary	Stationary	Stationary

These results facilitate to decide which the variables to include in the model based on the assumption of the model.

Model for ROA

Many models were fitted and the assumptions on residuals were checked. Only the models satisfying the assumptions were shown in this section.

$$\text{Model A}_1: \lg ROA_t = \alpha_0 + \alpha_1 \lg ROA_{t-1} + \alpha_2 LQ_t + \alpha_3 EFF_t + \alpha_4 EFF_{t-2} + \alpha_5 CAR_{t-2}$$

$$\text{Model A}_2: \lg ROA_t = \gamma_0 + \gamma_1 \lg ROA_{t-1} + \gamma_2 \lg ROA_{t-2} + \gamma_3 CAR_{t-2} + \gamma_4 LQ_{t-2}$$

Here lgROA is the logarithmic of ROA. Since the kurtosis values for ROA is high, logarithmic of ROA was used. Above models were fitted and the following results were obtained.

Table 4: Results obtained for Model A₁ and Model A₂.

Model A ₁		Model A ₂	
Variable	Coefficient	Variable	Coefficient
Constant	-1.771** (0.396)	Constant	-1.071** (0.347)
LQ	29.983** (8.743)	LGROA (t-1)	0.671** (0.141)
EFF	-0.741* (0.270)	LGROA (t-2)	-0.313* (0.132)
EFF (t-2)	1.017** (0.262)	LQ (t-2)	28.17* (10.337)
CAR (t-2)	0.063** (0.02)	CAR (t-2)	0.054* (0.02)
LGROA (t-1)	0.357** (0.107)		

Standard errors are reported in parentheses. *, ** indicates significance at 95% and 99% level of significance.

Model A₁: The model is significant since probabilities are less than 0.05 level of significance. There is a significant effect of LQ_t , EFF_t , EFF_{t-2} , CAR_{t-2} and $\lg ROA_{t-1}$ to $\lg ROA_t$ on banking performance of Licensed Specialised Banks in Sri Lanka.

Model A₂: Since probabilities are less than 0.05 level of significance, there is a significant impact of LQ_{t-2} ,

CAR_{t-2} , $\lg ROA_{t-2}$ and $\lg ROA_{t-1}$ to $\lg ROA_t$ of Licensed Specialised Banks in Sri Lanka. Therefore, the model is significant.

Table 5: Table of comparison of model A₁ and model A₂.

	Model A ₁	Model A ₂
Akaike Info Criterion (AIC)	-0.202476	-0.112213
Schwarz criterion (SBC)	0.066881	0.112251
R-squared	80.5%	77.3%
Durbin Watson statistic	1.726698	1.627818
Standard Error of regression (SE)	0.201983	0.213830

Summary of the fitted models A₁ and A₂ were given in Table 4 and 5. From table 5 it can be concluded that model A₁ is better than model A₂, since AIC, SBC, SE of regression are lower in model A₁ than model A₂ and R-squared is higher than model A₂. Therefore, model A₁ was chosen as the best model relating ROA, LQ, EFF and CAR. Residual analysis was done to check whether the assumptions on residuals hold for model A₂.

Residuals	Statistics
Mean	-4.33×10^{-16}
Median	0.012443
Maximum	0.409625
Minimum	-0.410260
Standard Deviation	0.186054
Skewness	-0.281643
Kurtosis	2.957744
Jarque-Bera	0.452024
Probability	0.797709

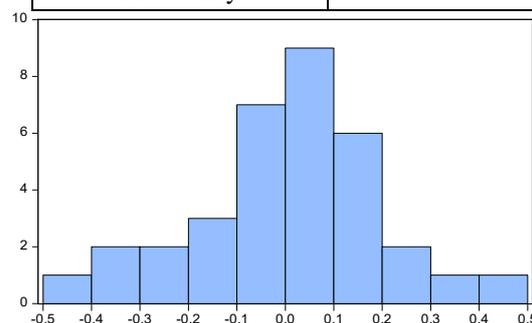


Figure 1: Results obtained for normality of residuals for model A₁.

The normality of residuals was checked and since probability is greater than 0.05 level of significance, residuals are normally distributed. Kurtosis is around 3 and skewness is a small value implying that this is good model.

The correlogram was checked to see if the residuals are random.

Q-statistic probabilities adjusted for 1 dynamic regressor

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
.|*.	.|*.	1	0.114	0.114	0.4815	0.488
**|. |	**|. |	2	-0.271	-0.287	3.2860	0.193
**|. |	**|. |	3	-0.212	-0.154	5.0661	0.167
.|. |	.|. |	4	0.052	0.022	5.1745	0.270
.|*.	.|*.	5	0.197	0.104	6.8188	0.234
.|. |	.|. |	6	0.058	0.015	6.9653	0.324
**|. |	**|. |	7	-0.207	-0.148	8.9096	0.259
**|. |	**|. |	8	-0.386	-0.336	15.924	0.043
.|*.	.|*.	9	0.113	0.122	16.549	0.056
.|*.	.|*.	10	0.129	-0.146	17.394	0.066
.|. |	.|. |	11	0.029	-0.024	17.438	0.096
.|. |	.|. |	12	-0.037	0.052	17.515	0.131
.|*.	.|**	13	0.110	0.240	18.226	0.149
.|. |	.|*.	14	-0.002	-0.096	18.226	0.197
.|. |	.|. |	15	0.011	-0.011	18.234	0.251
.|*.	.|*.	16	-0.093	-0.235	18.822	0.278

Figure 2: Figure of correlogram obtained for residuals for model A₁.

From figure 2, the residuals are random since all probability values are higher than 0.05 significance level. Thus, the assumption of random residuals holds for the model.

Table 6: Results obtained for testing serial correlation and heteroskedasticity for model A₁.

Breusch-Godfrey Serial Correlation LM Test		Heteroskedasticity Test: White	
Probability (F statistic)	0.2455	Probability (F statistic)	0.3826
Probability (Chi-Square)	0.1753	Probability (Chi-Square)	0.3418

From table 6, it is evident that the residuals are not serially correlated since probability values for Serial Correlation LM test are higher than 0.05 significance level. Also since probability values obtained for White Heteroskedasticity Test are greater than 0.05 level of significance, it is apparent that the variance of residuals is a constant.

Residuals analysis indicate that residuals are random, normally distributed around mean zero and constant variance and residuals are not correlated. Since all assumptions for residuals hold for model A₁, it was concluded that model A₁ is a good model for ROA. And the fitted model was as follows.

$$\begin{aligned}
 lgROA_t = & -1.770528 + 0.357015 lgROA_{t-1} \\
 & + 29.98268 LQ_t - 0.740957 EFF_t \\
 & + 1.016939 EFF_{t-2} \\
 & + 0.062897 CAR_{t-2}
 \end{aligned}$$

Model for ROE

Many models were fitted and the assumptions on residuals were checked. Only models satisfying the assumptions are reported.

$$\begin{aligned}
 \text{Model E}_1: ROE_t = & \beta_0 + \beta_1 ROE_{t-1} + \beta_2 ROE_{t-2} + \\
 & \beta_3 EFF_{t-1} + \beta_4 EFF_{t-2} + \beta_5 CAR_{t-2} + \\
 & \beta_6 CAR_{t-3}
 \end{aligned}$$

$$\begin{aligned}
 \text{Model E}_2: lgROE_t = & \gamma_0 + \gamma_1 lgROE_{t-1} + \alpha_2 LQ_t + \\
 & \gamma_3 CAR_t + \gamma_4 CAR_{t-2}
 \end{aligned}$$

Here lgROE is the logarithmic of ROE. Since the kurtosis values for ROE is high, logarithm of ROE was used. Above models were fitted and the following results were obtained.

Table 7: Results obtained for Model A₁ and Model A₂.

Model E ₁		Model E ₂	
Variabl e	Coefficie nt	Variabl e	Coefficie nt
Constant	3.526 (6.717)	Constant	0.811 (0.431)
ROE (t-1)	1.030** (0.133)	LGROE (t-1)	0.708** (0.101)
ROE (t-2)	-0.379** (0.121)	LQ	28.557* (10.005)
EFF (t-1)	-29.380** (7.008)	CAR	-0.0759** (0.021)
EFF (t-2)	52.655** (10.034)	CAR (t-2)	0.064** (0.021)
EFF (t-3)	-23.72** (6.879)		
CAR (t-2)	1.837** (0.359)		
CAR (t-3)	-1.669** (0.388)		

Standard errors are reported in parentheses. *, ** indicates significance at 95% and 99% level of significance.

Since probabilities are less than 0.05 level of significance except for the constant for the results obtained for Model E₁. There is a significant impact of $EFF_{t-1}, EFF_{t-2}, EFF_{t-4}, CAR_{t-2}, CAR_{t-4}$ and ROE_{t-1} to ROE_t to the performance of LSBs in Sri Lanka. Therefore, the model is significant. From the results obtained for Model E₂, since probabilities are less than 0.05 level of significance except for the constant, the model is significant and it can be concluded that there is a significant impact of LQ_t, CAR_t, CAR_{t-2} and $lgROE_{t-1}$ to $lgROE_t$ to performance measured by ROE of Licensed Specialised Banks in Sri Lanka.

Table 8: Table of comparison of model E₁ and model E₂.

	Model E ₁	Model E ₂
Akaike Info Criterion (AIC)	5.402572	0.005392
Schwarz criterion (SBC)	5.765362	0.229857
R-squared	82.8%	71.3%
Durbin Watson statistic	1.927372	2.081558
Standard Error of regression (SE)	3.250273	0.226781

Summary of the fitted models E₁ and E₂ were given in Table 8. From table 5 it can be concluded that model E₂ is better than model E₁, since AIC, SBC SE of regression are lower in model E₂ than model E₁ although R-squared is higher than model E₁. Therefore, model E₂ was chosen as the best model relating ROE, LQ and CAR.

Residual analysis was done to check whether the assumptions on residuals hold for model E₂.

Residuals	Statistics
Mean	-4.38×10^{-16}
Median	-0.040790
Maximum	0.443060
Minimum	-0.452691
Standard Deviation	0.212593
Skewness	0.478455
Kurtosis	2.944416
Jarque-Bera	1.301584
Probability	0.521632

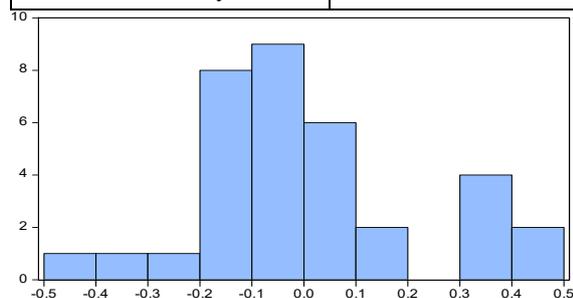


Figure 3: Results obtained for normality of residuals for model E₂.

The normality of residuals was checked and since probability is greater than 0.05 level of significance according to figure 8, it is evident that residuals are normally distributed. Acquiring a value is close to 3 for kurtosis and small value for skewness imply that this is good model. The correlogram was checked to see if the residuals are random.

Q-statistic probabilities adjusted for 1 dynamic regressor

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob*	
.|. |	.|. |	1	-0.053	-0.053	0.1031	0.748
.|. |	.|. |	2	-0.034	-0.037	0.1465	0.929
.|. |	.|. |	3	-0.130	-0.135	0.8170	0.845
.|. |	.|. |	4	0.102	0.087	1.2385	0.872
.|. |	.|. |	5	-0.012	-0.013	1.2447	0.941
.|. |	.|. |	6	-0.032	-0.044	1.2890	0.972
.|. |	.|. |	7	-0.079	-0.061	1.5723	0.980
.|. |	.|. |	8	-0.361	-0.397	7.7168	0.462
.|. |	.|. |	9	0.135	0.094	8.6141	0.474
.|. |	.|. |	10	0.161	0.157	9.9298	0.447
.|. |	.|. |	11	-0.067	-0.165	10.169	0.515
.|. |	.|. |	12	-0.234	-0.175	13.210	0.354
.|. |	.|. |	13	0.091	0.078	13.697	0.396
.|. |	.|. |	14	-0.016	-0.129	13.713	0.471
.|. |	.|. |	15	0.117	0.064	14.595	0.481
.|. |	.|. |	16	-0.059	-0.148	14.831	0.537

Figure 4: Figure of correlogram obtained for residuals for model E₂.

Figure 4 confirms that residuals are random since all probability values are higher than 0.05 significance level.

Table 9: Results obtained for testing serial correlation and heteroskedasticity for model A₁.

Breusch-Godfrey Serial Correlation LM Test		Heteroskedasticity Test: White	
Probability (F statistic)	0.8849	Probability (F statistic)	0.9860
Probability (Chi-Square)	0.8579	Probability (Chi-Square)	0.9599

From table 9 it is apparent that the residuals are not serially correlated since probability values obtained for Breusch-Godfrey Serial Correlation LM Test are higher than 0.05 significance level. And since probability values obtained for White Heteroskedasticity Test are greater than 0.05 level of significance, it is evident that the variance of residuals is a constant.

Residuals analysis for model E₂ indicate that residuals are not correlated, random, normally distributed around mean zero and constant variance verifying that the assumptions of the model fitted holds.

Since all assumptions for residuals hold for model E₂, it was concluded that model E₂ is a good model for ROE. And the fitted model was as follows.

$$\begin{aligned}
 \lg ROE_t = & 0.810728 + 0.708440 \lg ROE_{t-1} \\
 & + 28.55666 LQ_t - 0.075897 CAR_t \\
 & + 0.064428 CAR_{t-2}
 \end{aligned}$$

IV. CONCLUSION

The following models were obtained for banking performance of Licensed Specialised Banks in Sri Lanka.

$$\begin{aligned} lgROA_t = & -1.770528 + 0.357015 lgROA_{t-1} \\ & + 29.98268 LQ_t - 0.740957 EFF_t \\ & + 1.016939 EFF_{t-2} \\ & + 0.062897 CAR_{t-2} \end{aligned}$$

$$\begin{aligned} lgROE_t = & 0.810728 + 0.708440 lgROE_{t-1} \\ & + 28.55666 LQ_t - 0.075897 CAR_t \\ & + 0.064428 CAR_{t-2} \end{aligned}$$

It was evident that performance of Licensed Specialised Banks in Sri Lanka is significantly related to the factors Loan Quality, Efficiency and Capital Adequacy ratio. Also Loan Quality have highest impact on the performance of Licensed Specialised Banks in Sri Lanka.

For the study, financial data from 2008 quarter 1 to 2016 quarter 4 was used since Central Bank of Sri Lanka did not possess any data before that for Licensed Specialised Banks in Sri Lanka. More accurate models can be extracted for larger number of data points. Hence it was a limitation for the study.

After the war in Sri Lanka LSBs takes a main role in the rapid urbanization of country as a main supplier of housing market with rapid economic growth. Thus, it is suggested to apply time series analysis after some years to accurately model financial data of LSBs Sri Lanka to optimize banking performance.

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Artificial Intelligence based AFB microscopy for Pulmonary Tuberculosis in North India: A pilot study

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Abstract- Introduction: Microscopy is the simplest and the most important step in diagnosis of pulmonary tuberculosis. But the microscopy requires considerable experience and is bound to human errors. Artificial intelligence (AI) based microscopy can be an answer to this problem. AI can be used even where expert microscopists are not available. Sevamob provides artificial intelligence enabled healthcare platform to organizations. It uses deep learning for image recognition, machine learning for triaging and computer vision for object counting. AI models of various medical conditions are first trained in the software from anonymized image data procured from various sources. To determine the accuracy of AI based point-of-care screening solution for sputum, following were used. Android Smartphone / tablet with Sevamob app, tripod and a simple microscope. The system was operated by a nurse or a technician with minimal training.

Methods: 150 ZN stained smears of sputum samples from clinically suspected pulmonary tuberculosis cases were included in the study.

Results: Out of these 150 smears, 118 were found to be positive and 32 as negative by expert microscopist. These smears were also analyzed by AI system. Out of these only 6 smears were found to be false positive for AFB. Thus, the sensitivity and specificity of AI based microscopy was 81.7% and 80% respectively.

Conclusion: This shows that our AI based microscopy system can be very useful to find AFB and has potential to replace the requirement of expert microscopist in the coming future. Sensitivity and specificity also depend on the threshold used by our AI system.

Index Terms- Tuberculosis, artificial intelligence, microscope

I. INTRODUCTION

Microscopy is first and foremost step in the diagnosis of tubercular infections. But the microscopy requires considerable experience and is bound to human errors [1]. Also, in remote areas, due to lack of expert microscopist, timely diagnosis at initial level is not possible, which may lead to increased morbidity. Artificial intelligence (AI) based microscopy can be an answer to overcome this problem. AI can be used even in the remotest areas where expert microscopists are

not available.[3] The use of artificial intelligence in medicine is currently of great interest.[2,4,5,6] The diagnostic and predictive analysis of medical photos, for instance, photographs of retina[8] and skin lesions, microscopic pathological images[10-12] and radiological images. are one of the clinical practice fields where artificial intelligence is expected to have a major influence.[7-15]. This potential usefulness is largely due to advances in deep learning with artificial deep neural networks (NN), which consist of a stack of multiple layers of artificial neuronal links that loosely simulates the brain's neuronal connections, and methods specialized for analysis of images, such as the convolution neural network, a particular form of deep neural network that conceptually mimics the visual pathway [13,16,18]. Adoption of artificial intelligence tools in clinical practice requires careful, meticulous confirmation of their clinical performance and utility before the adoption.[17] Based on the urgent need for data standardization and interoperability in digital microbiology, we launched a cross-departmental prospective quality improvement project to incorporate artificial intelligence digital microbiology technology and outline the resource requirements for implementation. The solutions presented here empower microbiologists and pathologist to gain an appreciation of and enable the assessment of the appropriateness of the AI system for diagnosis. We have also shown that current AI systems can aid in the timely diagnosis of infections in resource constraint setting of developing countries like India. The use of artificial intelligence-based diagnosis and data regarding the same is scarce to our best knowledge.

Sevamob provides artificial intelligence enabled healthcare platform to organizations. It uses deep learning for image recognition, machine learning for triaging and computer vision for object counting. AI models of various medical conditions are first trained in the software from anonymized image data procured from various sources. The software can then be used to screen for these medical conditions in new samples. The system can work fully off line in last mile, low resource settings. We therefore planned this study with the aim to evaluate AI for identification of Acid-Fast Bacilli (AFB) in ZN stained sputum smear.[26]

II. METHODS:

This study is a retrospective observational study and this study was done at three Sevamob pop-up clinics at Lucknow,

Jharkhand and Rajasthan, India. Sputum samples from 150 clinically suspected pulmonary tuberculosis patients were taken to do this study. To determine the accuracy of AI based point-of-care screening solution for sputum, following were used: Android Smartphone/tablet with Sevamob app, tripod and a simple microscope. The system was operated by a nurse or a technician with minimal training. The user first prepared Ziehl-Neelsen stained smears from sputum samples of clinically suspected pulmonary tuberculosis patients. The user then used the smart phone app to analyze camera feed of microscopic images of various sections of the slide. The app confirmed if the sample had AFB bacterium and even marked it on alive camera feed. Detection of AFB was done on site by Sevamob AI which worked fully offline on mobile and could be synced on cloud once network was available. AI was trained to detect AFB and it showed the percentage probability of the detected AFB. 70% was taken as the threshold to be considered as positive by AI. The images were

confirmed by the expert microscopist as AFB positive or negative. The evaluation of true positive, true negative, false positive and false negative was done based on the result of the comparison between the expert and the AI result.

III. RESULTS:

We analyzed 150 smears of sputum samples for AFB from clinically suspected pulmonary tuberculosis cases, as shown in table 1. Out of 150 smears 118 were found to be positive and 32 as negative by expert microscopist. Based on these findings' sensitivity, specificity, positive predictive value, negative predictive value, likelihood ratio of AI based microscopy was calculated. These are depicted in table 1, 2 & 3.

Testing output of expert microscopist		Positive	Negative
Sample	Test		
Sputum	AFB smear	118	32

Table 1. Results of AFB smear examined by expert microscopist

Testing output of AI for AFB smear			
True positive	False negative	True negative	False positive
98	22	24	6

Table 2. Results of 150 smear samples by AI system

Diagnostic parameters	Value	95% CI
Sensitivity	81.7%	73 % to 88%
Specificity	80 %	61% to 92%
Positive Likelihood Ratio	4.07	1.98 to 8.36
Negative Likelihood Ratio	0.23	0.15 to 0.35
Disease prevalence	79.7 %	72 % to 86 %
Positive Predictive Value	94 %	87 % to 97 %
Negative Predictive Value	52.2 %	42 % to 62 %
Accuracy	81.1%	74 % to 87 %

Table 3: Diagnostic parameters of AI system

Image 1 and 2 shows the % probability of AFB by AI system. % probability of AI images ranged from 51% to 99% in a microscopic field.

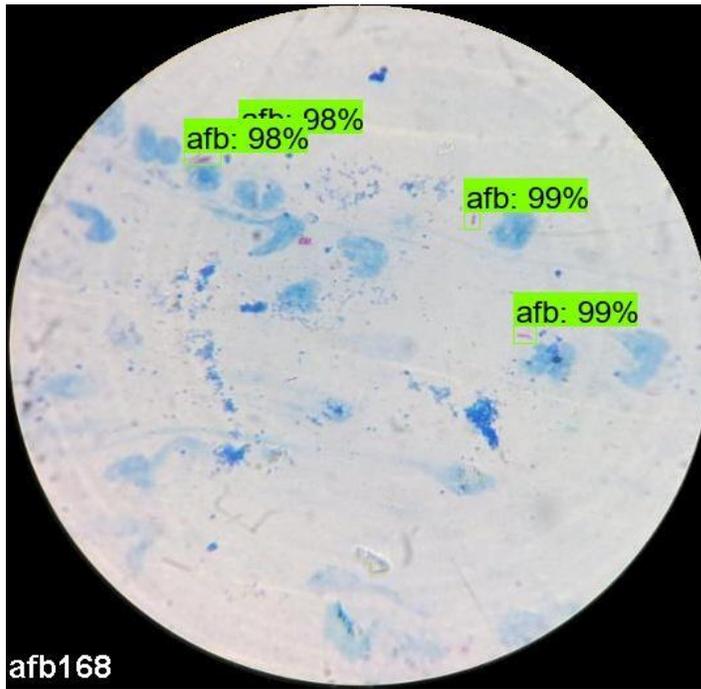


Image 1: Shows the marked area with % probability by the AI based software

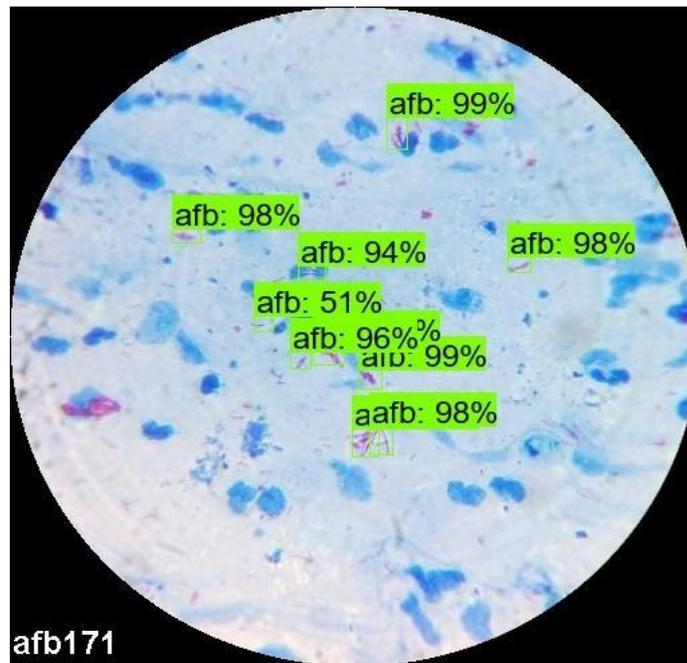


Image 2: Shows the marked area with % probability by the AI based software

IV. DISCUSSION

In the present pilot study, we have analyzed 150 smears by ZN staining for AFB by AI system. The sensitivity and specificity were found to be good. This shows that this particular AI system may be very useful for AFB smear microscopy and can replace the requirement of expert microscopist in the coming future. Sensitivity and specificity of AI also depends on the threshold set for the AI system used. In our study this threshold was set at 70% and this was decided after training and internal lab testing of samples at different thresholds of 5% intervals (50%-80%). We found optimal sensitivity and specificity at 70% threshold only. It should be noted that this idea is called as self-adjusting neural networks that adjust themselves to a boundary to that the input data and their outcome must convert. To our understanding the meaning of a self-learning classification system adjusts the "rules" to a given final outcome. At higher threshold, there were too many false negatives. At lower threshold, there were too many false positives. It finds appropriate that the implementation of an automated diagnosis or pre-screening system consists of several modules that should work independently from each other. To start with, this concept a control and evaluation of the objective image quality is necessary so one can easily evaluate between the results of AI and microscopy. The system has used various enhancement techniques, and it has best quality to analyze the microscopic sputum smear images, segmentation algorithm is developed to automate the process of detection of TB using digital microscopic images of different subjects. Shape features extraction technique had been implemented to extract eleven shape features and finally for classification the support vector machine was used to be a pattern recognition tool for classify the object in sputum smear images to TB bacillus object and non-TB bacillus object. [28]

As per our best knowledge such AI based pilot study has never been done before in India or elsewhere in the world. Few automated microscopy systems have been used in the past, but they were not based on artificial intelligence. Costa *et al* in year 2017 developed an automatic microscopy method for identification of AFB, images were based on Red and Green color channels using global adaptive threshold segmentation. [19,28]. They showed that their system was 76.7 % sensitive. Sadaphal P *et al* in year 2018 proposed an automated, multi-stage, color-based Bayesian segmentation system. This system grouped the smears into definite, possible and non-TB by passing photo-micrographic calibration [20, 28]. However, they did not discuss sensitivity and specificity of their system.

Fisher et al, Valen et al, Long et al, Ciresan et al, Ning et al, in their study said that neural network have outperformed the conventional approach in term of accuracy and generalization when we perform cell segmentation in subculture of multiple cell type. [21,25]. In case of histopathology examination AI have been successfully used to segment the colon gland, breast tissue, as well as the nuclei as reported by different authors in their study [25,27,29-34].

The limitation of our study is the small sample size. A larger sample size study is further required to validate our system.

V. CONCLUSION

In this pilot study automated AI based software for tuberculosis bacilli identification had been done. This AI based software method reduces fatigue and screening time by providing images on the screen and avoiding visual inspection of microscopic. The system has an acceptable degree of accuracy, specificity and sensitivity.

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Youth bands: between theories of the past and presence in modern society. The analysis of the phenomenon in official statistics

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Abstract- The research carried out to date on the subject of youth gangs have studied the phenomenon from different and sometimes radically opposite angles. The “gangs”, moreover, have taken on characteristics and reasons to be peculiar over time and space. It is thus impossible to trace the identikit of an immanent and hegemonic band model, and any attempt to do so can only prove to be partial and reductive.

Even the denomination is particularly controversial: the term gang, until now used predominantly by classical American criminology, is now more than ever imbued with a securitized and criminalizing rhetoric. The objective of this work is to develop an integrated analysis on minors reported to the Public Prosecutors at the Juvenile Courts based on the latest ISTAT data. The surveys carried out by ISTAT on the data of the judicial offices complete the system of juvenile criminal detections allowing to estimate, as far as possible, the total of the phenomenon of deviant youths included in groups. The ISTAT surveys allow an excellent description of the phenomenon of group juvenile crime and an element of comparison for the planning of active law enforcement policies. Data from Juvenile Justice Offices contradict many of the clichés about adolescents. It is not true that criminal activity has increased, it is not true that it is connected with foreign minors. On the contrary, the criminal activity is in decline both at the child and adult level, as well as the number of foreigners involved.

I. INTRODUCTION

The first organic reconstruction of the phenomenon of youth gangs was made by researchers at the Sociological School of Chicago, in the context of theories on social organization and disorganization. Social marginalization, juvenile delinquency or prostitution became the main interest of the emerging “ecological” school, which aimed to analyze the forms of behavior and socialization that arose in a new urban ecosystem. The first research in Chicago neighborhoods was aimed at gathering as much data as possible on the social composition of the city, on the interaction of groups, their life forms and their territory, using the methods of participant observation and the qualitative interview, given that in those years the gang phenomenon had assumed imposing dimensions. The study of the gangs was Thrasher's (1927) seven-year field research goal that published "The gang" giving an account of the trends and structure of over 1300

uniformly distributed street bands in every corner of the city, as Chicago, with its peculiar historical and social dimension, provided the objective conditions favorable to the birth of innumerable and varied neighborhood aggregations.

In the words of a recent reconstruction of Dal Lago (2002) the Chicago of the twenties was a “*gathering and sorting point for wandering and seasonal workers, a conglomeration in which the huge capitalist fortunes coexisted with the slums, and was considered the city which summarized the contradictions of American capitalism, and therefore the urban type par excellence*”. This was the beginning of a long period of studies on the phenomenon of gangs which up to the present day particularly involved deviant sociologists who claim that gangs, after a silent period, seem to have returned to social space, with particular reference to the youth ones, even if modern theorists identify them as street organizations.

II. LITERATURE REVIEW

R.E. Park (1969) proposed an important academic renewal in the studies on the city of Chicago and its neighbourhoods (Rauty, 1991); these contributions turned into a real research activity on delinquent types of association. The result, which emerged from the first surveys, showed that alongside the traditional male aggregative forms in bands, there was a small number of gangs formed by women only, some dedicated in particular to the robbery, others with recreational purposes, or passionate about baseball. However, the “mixed” bands constituted the majority; the presence of a woman in that case was characterized by her being “tomboy”. Instead, in particular in the more peripheral areas, the gender difference was not considered. So, although this was probably a good reason to be labelled as immoral (as in the case where a young woman ends up in a psychiatric clinic for this reason), it seems that men and women sometimes live together peacefully in the same organization. The Chicago neighborhoods differed in social classes and were subject to continuous “restructuring” in their respective compositions. As the various communities saw their wealth grow, they tried to move to richer areas. The latest arrivals were, naturally, staying in the worst possible conditions, the so-called “dormitory neighborhoods”. The ability to accumulate fortune allowed access

to richer and more comfortable areas, often through bloody conflicts on wages and working conditions (Renshaw, 1970).

However, as Hagedorn (2011) rightly points out, from this scenario of conflict and marginalization, at least African Americans were structurally excluded. For them the ghetto and the so called "black belt" remained the only realistically feasible horizon. This overall ferment was what the Chicago sociological school called "social disorganization". Given the complexity of the urban framework, it is certainly no coincidence that following restructuring of '29 the city became a huge laboratory of social control, that is the "true anguish of the dominant elite in American history" (Mills, 1966).

In this context, Thrasher (1927) develops a first historical definition of "gang", as an "interstitial group formed spontaneously" and "integrated through conflict", characterized by some typical behaviors such as "face-to-face relations, beatings, movement in space in a compact group, conflict and planning". But the first constituent factor was represented by the "development of tradition, of internal structure not dictated by reflection, team spirit, solidarity, morality, group conscience and rooting in a territory".

More specifically, the definition of "gang" was attributable to the structuring of an internal organization, to the use of violence characterized by a marked hegemonic masculinity, in search of a territorial and cultural dimension to be defended as a sign of identity, to the capacity of to plan activities of various kinds; but also, solidarity, the participatory and affiliative spirit, the need to fill a void and cultivate the bonds that the organizational structure of the company obviously did not guarantee. It must be recognized that, in those years, the gang exposed society's deficiencies, and not (only) the pathologies of the individuals who were part of it, was already revolutionary in itself. The slums of "The Gang" were not only repellent and infamous environments, but also full of charm and mystery, where gangsters, far from formal and conventional social control, could develop the most diverse forms of organization, autonomously creating rules and roles, choose reasons and paths of life.

The emphasis is so often placed on diversity: Thrasher (1927) does not determine a hegemonic model of organization, but identifies many different ones, claiming that "two equal gangs cannot exist". Moreover, not all gangs are necessarily criminals: most, though reproducing deviant behavior, simply have sporting or recreational purposes. A band, in the embryonic state, is constituted only by informal groups of children playing in the neighborhood: it is from there that they will gradually develop an internal structure and common traditions, sometimes clashing also with the hostility and disapproval of the surrounding adult environment.

Following the reconstruction of Thrasher, the importance of data on the ethnographic composition of the organizations stands out, which together group a number close to the 25,000 units of affiliates. The members of 35% of the registered gangs have an average age between eleven and seventeen, while, out of 1313, only 45 groups are made up of citizens of American origin. Although the birth of the gangs was largely due to a migrant context, the conflicts between them very rarely - according to Thrasher - were due to ethnic factors: even 40% were formed by individuals of different nationalities, while 60% had a monoethnic composition. The use of violence was essentially due to reasons of

territorial control and to the observation of tacit ethical codes aimed at preserving honor and respect. The natural enemy, on the other hand, was very often common: public authority. Not all the gangs, although most were, were organized in a top-down manner and led by recognizable leaders: many were characterized by their horizontality, so much so that Thrasher alludes several times to "primordial forms of democracy". This does not mean that they were capable of emancipating themselves completely from widely understood social control: several elements of the dominant society were reflected within their lives as adults and in the customs of the particular communities in which they found themselves. An obvious example is that relating to gender issues, since the prevailing attitude was decidedly masculine: the woman admitted into the gang tended to be the lover of the leader, a man chosen in relation to his marked abilities of violence and determination in 'to face every situation. Women were rarely allowed to play any role in the organization, except in cases of utilitarian sex-related employment.

Many elements contained in the work of the Chicago School have been, and still are, central to the gang debate; from territoriality to violence, from sexism to hegemonic masculinity, from the ethnic issue to the objective conditions of social marginalization of the young people involved, from the "leader" hierarchy to its opposite (the so-called "primordial forms of democracy" told in "The Gang"). The scientific innovation of this contribution lies in the "ecological" research method. This term meant the paradigm through which to scientifically read the processes of evolution and transformation that took place in society: the technique of ecological study, that is to say of aggregates, allowed to transcend individual to gather, through the collection of empirical data, the characteristics of large groups of people (Williams, McShane 2002). Urban ethnography, the collection of life stories, were also "adequate tools to deeply grasp the elements and events that shape individual lives". Chicago scholars had the ambitious goal of describing the complex scenarios of urban social relations of their time. The idea was to bring the many observable elements back to a minimum common denominator, enhancing the most visible features and trying to give a sort of logical predictability to what happened in the real world. For example, he claimed Park (1969) in "Introduction to the Science of Sociology" that the majority of social groups originate from conditions that are typical for all groups of the same species, generating developmental mechanisms that are characteristic and predetermined and that in definitive can be predictable.

The recent critical remarks proposed by Hagedorn go in this direction, accusing the Chicago School of modernism, determinism and opportunism in hiding or underestimating the phenomenon of racism as an essential element to be taken into account in the birth and development of gangs in American metropolis of the 1920s (Hagedorn, 2011).

The search for common characteristics of gangs, by combining the factors relating to their genesis, arguing that the members had the unconditional possibility of emerging from social disorganization to integrate into the working or media class, demanded that the reference society, whatever it may be, should be welcoming, mobile and in economic expansion. The latter aspect supposes an idea of disorganization, determined by the abandonment of a neighborhood of entire groups that move to a

place more suited to their new economic capacities, calls for social mobility and not structural ethnic marginalization; it refers to the forecast of a constant economic and social growth and not to a context of cyclical recession and racial segregation.

But even the Chicago of that time, the protagonist of an unstoppable capitalist rise, quickly denied this prediction. Hagedorn (2011) documents in detail clashes between white gangs of Irish origin and African-American gangs at least until 1919, the year in which the clashes assumed the tenor of the “racial uprisings”, with the authorities openly lined up against the inhabitants of the black belt. Thus it becomes difficult to understand the assertion of Thrasher (1927) that argue as, in Chicago, “race divisions disappeared and ethnic divisions could be considered superficial”.

Other works, such as Zinn's (2010), tell of an uninterrupted racial conflict with repeated raids and assaults conducted by white gangs in the segregation spaces “assigned” to black men and women, at least until the last decades of the twentieth century; conflicts, according to the historian, largely concealed by intellectual and academic circles, directly fed by the most influential American corporations.

Further contributions on the study and the nature of the youth gangs are to be attributed to Albert Cohen. Within the classical sociological literature, it possible to find a line that connects youth bands and deviance according to two great traditions: on the one hand, the reflections of the Chicago school and develops later through the so-called labeling theory, on the other the Durkheimian reflection of the anomie and the fundamental function that deviance plays in the realization and maintenance of the social order (Bugli, 2010). According to this last perspective, the element that leads to the non-observance or infringement of the current rules is represented by the degree of adherence and importance that are granted, by an individual or a community, to the social norms in force.

Deviance, for Durkheim (1976), assumes within certain limits a positive function, since it strengthens the collective consciousness and marks the boundaries of what is considered socially licit. The theory of anomie also emphasizes the need for society to regulate the aims of its members by keeping them within the limits of the possible realizations, thus avoiding the development of tension and frustration mechanisms capable of determining irrecoverable fractures. Merton (1949), subsequently, exploring the relationship between the cultural and structural level of a given social context, added the idea that anomie does not necessarily develop due to the collapse of the only desirable goals, but, rather, to the fracture of the relationship between the same purposes prescribed and the legitimate ways to achieve them. It is, in this sense, that deviance could be explained as the result of a break in the organizational model at the head of the society, and in particular between the ideals of culturally dominant success and the concrete possibilities to reach them available to all. In keeping with this thesis, Cohen (1974) addresses scientific interest to the deviant consequences inherent in the vertical and inhomogeneous composition of the social structure. His work is generally included in the field of theoretical studies on anomaly and structural frustration, but in “Delinquent Boys”, there is no reference to the theories of Merton and Durkheim. At the basis of his theory of delinquent subcultures, Cohen suggests that “delinquency is not the expression or explanation of a particular type of personality: it

can be imposed on any type of individual if the circumstances favor an intimate association with delinquent models” (Cohen, 1974). The reasons behind some deviant behaviors that see young males of the working class as predominant protagonists, spring from belonging to a certain social stratum.

A subculture according to Cohen represents a cultural phenomenon since the participation of each subject in this system of social norms is influenced by his perception of the rules; subculture, moreover, because the same social norms are shared only by those who in some way believe they can benefit from them, generating a favorable climate for their reproduction. This is a benefit not of an economic nature or in any material sense: the essence of a subculture is constituted by immediate hedonism, in contrast to the search for long-term projects or activities that arouse little interest, since they require specific knowledge and skills acquired only with the study.

An important component of this form of self-esteem and well-being is the refusal to obey to any authority, excluding the pressures exercised within the group itself where relations tend to impose themselves not with violence but “with a strong solidarity” (Cohen, 1974). The triggering element that leads young males, of the working class, to disassociate themselves from the hegemonic cultural values of society to take refuge in a subcultural perspective and in mechanisms of rejection is that there is a problem of general possibilities of success; the young of the most disadvantaged groups manifest discomfort (often a total refusal) of adaptation to the values and cultural norms of the middle class, implicitly rejecting the dominant American evaluation system. Taking note of this “structural tension” that begins to manifest itself from the scholastic path, Cohen's tries to demonstrating that the birth of subcultures of criminals represents an endemic phenomenon: if the original problem is represented by a frustration of status, then “the social position of an individual is one in which he is in the eyes of someone. So this is not a property of the individual fixed once and for all, but a position that varies from the point of view of who is ever producing the judgment” (Cohen, 1974).

This perspective determines in the young a problem of social collocation, or using Cohen's terms, a “problem of adaptation” to the hegemonic standards and success values. As structural, this condition of rejection and hostility will be widely shared by the subjects belonging to the same social class. The emergence of a deviant subculture can become in this sense a collective solution to the problems of social adaptation, whose “subcultural” values will be constituted precisely starting from the reversal of those of the dominant culture (Cohen, 1974). A subculture is a new way of considering and being considered, a possibility to validate the choices of those who are inside the group and to look with hostility on those who remain outside. This deviant result of the interaction, finally, is not to be attributed in particular to any of the participants, but is an emerging reality on the level of the group.

While the theory of delinquent subcultures by Cloward and Ohlin (1966) often tends to be simplified and brought back into the context of the work on anomie, it actually seems to contain a first reading that places street bands in a resistance perspective, with a vision of reality strongly oriented to the individual and his relationship with the established order.

Excluding that delinquency was a component of the criminal's genetic heritage, the "faults" of the system that would lead to forms of collective deviance could basically be traced back to two variants: on the one hand, the design of successful goals valid for all men and for all the classes (even for those who do not have much chance of reaching them); on the other, the lack of attention to emerging degradation in certain urban contexts, creating forms of segregation, abandonment and marginality.

It is with these premises that delinquent subcultures can begin form in the districts of American metropolises, in the view guidelines consisting in a set of "prescriptions, norms or rules of conduct that establish the activities required for a member of the subculture" (Cloward and Ohlin, 1966). At the center of the birth of the deviant groups, as we have seen for Cohen, there would therefore be a problem of the legitimacy of the rules: by revoking their support for certain areas of the established law, officially prohibited forms of conduct are invested with legitimacy. The members of the delinquent gangs have a clear awareness of their deviant position, and are preparing for the time when society will force them to choose which side to take; hence the need for an "internal subcultural regulation" (Cloward and Ohlin, 1966) capable of giving to the components significance in their psychological and social economy.

There is an original element within the condition of anomie in which the poor inhabitant of a highly degraded urban environment is facing. If for Durkheim that society is stable in when people are satisfied with their fate of life, aspiring to achieve only what is realistically possible for them to achieve, for Merton stability is a direct consequence of the tendency to balance between aspirations and norms, between culturally prescribed goals and socially legitimate means to achieve them (Melossi, 2003). For Cloward and Ohlin (1966) the element of rupture is, however, to be found even further upstream; it is true that there is an apology of success that seeks to forge valid meanings for all members of society, but it is doubtful that it manages to "cannibalize" opinions to such an extent. The structural restrictions faced by members of the lower socio-economic level, and in particular adolescents, provoke in them an attenuation of the pursuit of the goals of success, which belong to the ideology of equality of possibilities.

If the tendency to seek constant economic improvement is unquestionable, on the other hand there is the awareness that a large part of the goods of life remain inaccessible to them. Thus, adaptation is not actually aimed at successful imaginaries, but rather at a closer horizon (that of work and social conditions that can be concretely reached by a member of the class to which they belong). Not, therefore, a split between aims and means, but rather between different aims; that is among those defined by young people for themselves in relation to the means actually perceived as available and those prescribed by society in relation to their own structure.

Cloward and Ohlin (1966) doubt that an inhabitant of a poor neighborhood, but "rich" in social relations, may wish so intensely to abandon his environment and his relationships to jump into the unknown world of the middle class.

The anomaly generates in this sense a "problem of adaptation" that takes root even further upstream than the moment in which the subject will realize that the means at his disposal are

not proportionate to his objectives: from the beginning of his age adult he is fully aware of the limitations of his horizons.

For Cloward and Ohlin the element of awareness is a decisive piece to define the deviant trajectory; for this reason, the authors focus a lot on the problems of adaptation that the poor have with respect to an imaginary framework theoretically achievable. Thus freed from the adhesion to the complex of existing rules of success, the young males of the lower classes can choose the path of collective delinquency to seek alternative satisfactions. It is evident that the members of a nascent delinquent subculture must undergo a complex process of changing attitudes towards themselves, towards other people and towards the existing social order before such a transformation can take place (Cloward and Ohlin, 1966).

Delinquency therefore does not arise simply from a structural frustration, but from a complex process of internalization of one's basic limits, and from the contextual determination to look for other possible opportunities. In explaining the dynamics of the "development of delinquent subcultures" a simple mechanism of cause and effect is not described, but three distinct "levels" are identified from which the future delinquent must pass in order to complete his complete transformation. First of all, the "process of alienation": the most important step in revoking feelings that support the legitimacy of conventional norms consists in attributing the cause of one's failure, or predicting failure, to the social order rather than to oneself. If a person attributes his failure to the injustices of the social system, he can criticize the existing order by using his efforts to reform it or disassociate (alienate) himself from it. On the contrary, if the cause of its failure were reduced to its own incapacity, it would rather feel the duty to change oneself and not the system. Once the alienation, development and maintenance of a delinquent sub-culture has taken place, it is obviously a collective undertaking. Although mainly individualistic deviance forms may arise, the authors hypothesize that if the "failure" is attributed to the inadequacy of the existing institutional arrangements then it is easier for the reaction to become collective. This is why it is necessary to defend the (collective) "anti-system" choices from guilt, anxiety and fear. And this can happen when the rules are considered violated as morally binding and in this sense have a strong collective support. Those who are part of a delinquent subculture are exempt from feelings of guilt, since they have conceptually separated the question of the legitimacy of the rules from that of their moral validity.

The theory of subcultures ends with a detailed analysis of how these concretely operate in the real, propagating from member to member and passing from generation to generation. In this sense Cloward and Ohlin take up the theory of the differential association of Sutherland (1937), according to which the delinquency originates from the learning of a set of values, norms and attitudes in contrast with the dominant culture. Learning (of deviant behavior) occurs thanks to processes of interaction with individuals or groups that attribute positive meanings to deviant actions (Cloward and Ohlin, 1966).

However, common are the pressures to the birth of a subculture, these are distinguished from the authors substantially in three types, referable to the typology of urban zone in which they operate. A criminal subculture, referring to those who are engaged in criminal activities for economic profit, is placed in

those degraded urban areas but still somehow rich in social ties suitable for protecting this type of deviant behavior. Then there is the abstentionist subculture, populated by those who react to failure by trying to “rise” by using drugs, located in depressed and disintegrated areas, perhaps “as a result of wicked changes in the urban plan”. And finally, the conflictual subculture, steeped in violence and hegemonic masculinity, typical of those neighborhoods in the American metropolitan suburbs (Cloward and Ohlin, 1966).

The most significant datum of the theory of delinquent subcultures probably lies in introducing unconditionally the element of awareness in the deviant choice. Unlike Cohen, in “delinquent boys” or those of Sykes and Matza (1957), in “Techniques of neutralization: a theory of delinquency”, the delinquent is not a person who continues to attribute legitimacy to the official norms of society, albeit in a substantially unconscious in the first case or possibly conscious in the second. He is not grappling with an ambivalent personality due to the position of challenger of certain values of the middle class of which, however, he still recognizes a certain value, nor is he in a precarious psychic condition due to the “neutralization” of the conventional norms that he has operated while continuing not to repudiate them.

The deviant is not plagued by continuous feelings of guilt, growing anxiety and it is a futile effort to continue to direct the research towards “psychological” concepts of delinquency. There is a conscious intentionality in its behavior, although these continue to be the product of a system of structural inequalities, invariably reproduced outside the sphere of its possibilities.

The contribution of Matza (1969), outlined in “How to become deviant”, does not represent a real study on gangs but, on the contrary, a process of understanding on the path of the deviant. The critical objective is aimed, first of all, at the impossibility of treating man as an object incapable of resisting the forces of the surrounding environment and irresistibly attracted to deviance regardless of his will following circumstances that are objectively determined. Using a minimum common denominator for the analysis and the study of “affinities” and “affiliations”, Matza maintains that, until then, the totality of deviant scholars had used research tools to explain the scope of inorganic objects rather than that of human beings. The concept of affinity is understood as an etiological connection between a cause, such as ethnicity, poverty or social disorganization, and an effect, deviance. Similarly, the concept of affiliation describes a relationship between an objective context, such as the presence of delinquent gangs in a degraded neighborhood, and a subject, who becomes equally delinquent because of “conversion” to a conduct that is new to the subject but already consolidated for others.

The main concern is the distance between these theories and the multiplicity of subjective experiences which represents a schematic and reductive reading of human phenomena.

The problem is that in reality people considered deviant may have their own motives, goals and moral conceptions, which are incompatible and incomprehensible if the assessment remains linked to the “dominant” culture, or if they are supposed to reduce them to what they actually “are not” for convenience analytical. Matza suggests, therefore, that when the subject of the research are activities that in some way violate widely shared standards of conduct and morality, we must first establish a relationship of profound understanding and empathy with the subject himself.

Establishing a relationship of empathy means entering in the world of the phenomenon we want to describe almost to the point of sharing it, demanding to give it a faithful and non-reductive representation, without violating its integrity.

The change in research prospects, compared to the past, took place with the contribution of the Birmingham School; the latter moves the theoretical reflection towards an analysis of the symbolic and rebellious capital inherent in the young, emancipating the study of the bands from the problem of deviance. Starting from the assumption that band does not necessarily mean deviance, the need is felt to investigate those paths that, through the construction of a common image of tastes and styles, express completely new and unpredictable subjectivities (Bugli, 2010).

The “ritual resistance” becomes the paradigm around the development of the research centre for the study of contemporary culture in Birmingham, founded by Hoggart in 1964 and directed by Hall; this research centre tries to explain some behaviors and trends that emerged strongly in the youth of the English working class.

For Hebdige (1990) the objective became to assimilate, to the concept of subculture, a study perspective that took into account the ideological, economic and cultural factors that weigh on it. If, on the one hand, it is the social class, and not the age, the explanatory element of the production of youth subcultures, on the other hand, the practices and languages contained in them cannot be explained simply by deviance, but it is necessary to analyse the changing expressions of the traditional culture of the working class, which, at that time, expressed a strong symbolic antagonism towards the culture of the middle class.

The subcultures are seen as contest rituals “played” by young people “in the theater of hegemony” undermining the myth of consensus: their emergence is linked to those historical periods in which a crisis of consensus becomes evident. As in a theatrical scene the conflict is expressed at the level of the imaginary although it reflects real contradictions (Hall and Jefferson, 1993; Macciocchi, 1974). In this way several “spectacular bands” are investigated that inhabit many of the main English cities. The British metropolises traditionally had a strong concentration of workers, and at the same time constituted European outposts in the dynamics of industrial and social restructuring (Tabboni, 1986). The response of these young people is a declaration of independence, refusal of anonymity and insubordination; it is, also, an indirect confirmation of the condition of submission. The subcultures constitute a gesture of both request for attention and rejection (Hebdige, 1991).

Almost a century after the publication of Thrasher's research the predominant definition of gang has changed radically. Much of contemporary American and European criminology has abandoned any kind of social or cultural interpretation of juvenile delinquency, preferring a perspective linked to the dogma of security in the urban peripheries. According to Brotherton (Queirolo Palmas, 2010) the studies by Klein, Kerner, Maxon, Weitekamp (2001), place particular emphasis on three elements: 1) the evaluation of how external observers see bands; 2) how the members of a group perceive and define themselves; 3) the reference to pathological implications since the bands are involved in transgressive practices that break the legal codes and raise reactions of social control by the community.

The “European paradox”, according to Klein et al. (2001), consists in the fact that in Europe the existence of youth gangs is not fully recognized, unlike the United States, where instead the presence of gangs is a known fact. This lack would be due to a presumed difference, both quantitative and qualitative, of the phenomenon between the two continents, and yet, argues Klein, it would contradict the empirical reality. Europol, for example, already indicated in 2002 the presence in Europe of 4,000 bands and 40,000 affiliates to them. It is starting from the idea that Eurogang has decided over the last two decades to structure a research plan aimed at guaranteeing a methodological and linguistic formalism useful for comparing the data collected in different European urban and cultural contexts. The objective was to create a set of tools useful for interpreting different situations and attempting to bring them back to a minimum common denominator, starting precisely from the search for a general definition of gang.

The latest version states that: *a street gang (or a troublesome youth group corresponding to a street gang elsewhere) is any durable, street-oriented youth group whose own identity includes involvement in illegal activity* (Weerman, 2009). This is a definition traces the existence of the phenomenon starting from the presence of some elements: the duration in time, a certain number of months sufficient to create an idea of stability; territoriality, in the sense that the group must spend part of its time outside the typical places in which they are subjected to the control of adults, such as school, home or work; age, which must be in most of the components just over twenty; finally, carrying out illegal activities as a distinctive feature of group identity.

It is above all the latter component that would indelibly characterize the gang, the accomplishment of systematic violations of the legal codes (Weerman, 2009). For Klein (2001) it is always possible to trace the existence of distinctive signs (such as a name, colours, symbols, tattoos, graffiti, etc.); to reconstruct the identity of the group and assimilate it to a youth band is involved in illegal activities as a form of subjectification of young members. The eurogang researchers have recognized that one of the main effects of the bands is precisely the increase in their delinquent and criminal behavior (Klein, Maxson, 1989). The awareness of being involved in criminal behavior that will lead them to a judicial process, causes the internalization of the need to differentiate significantly from other young people.

Violence, although it is not the only form of deviance that develops within youth gangs, remains an inevitable distinctive sign. Indeed, exercising violence makes it necessary both to preserve the identity and the “respectability” of the group, as well as in relation to the fact that the very existence of the band is constrained by the physical presence in a territory (district, street, square) of to defend against possible invaders (Klein et al, 2001). If the definition represents a common starting level, the goal of the researchers remains to provide a series of useful tools for classifying, differentiating and comparing the gangs of different cities.

Several authors identify as a comparative objective the definition of a complex structural model within which we can appreciate some essential characteristics of a youth band. Using the formality/informality parameter describes an important classification parameter for the internal organization. The different levels of participation, both in quantitative terms (time spent in

group activities), and in qualitative terms (degree of authority and experience of the individual member). Another variable is the existence of moments of collective confrontation, such as regular meetings, or the use of rules written or handed down orally. The existence of a leader is considered particularly important, according to the hypothesis of hierarchical structures of gangs. There are also levels of comparison relating to the activities carried out, in which the specialization in performing certain illegal activities (especially in relation to the drug market) is identified as a distinctive trait. Other trait involves maintaining relations outside the group, with gangs from other cities, but also with the neighborhood or other gang members currently in prison (Weerman, 2009).

The understanding of internal structures thus takes on centrality in the overall analysis of gangs. Rostami, Leinfelt, Holgersson (2012), take up the application method of Maxson and Klein which propose a “grid” composed of some types of bands divided by reason of: dimension, duration, local roots, activity carried out and age of the components.

Traditional gangs, for example, are those that have existed for at least twenty years, count hundreds of members and contain subgroups formed in relation to the age and duration of the member's affiliation. They are distinguished by the defense, even violent, of their territory. Equally “territorial” are the Neo-traditional gangs, which instead have only about fifty members, a duration close to ten years, and are divided into subgroups, although the definition of these bands is less pronounced. The Collective gang instead, would be characterized by the poorly structured coexistence of a mass of adolescents and “young adults”; although it has existed for several years, these bands do not have such obvious distinctive symbols, and tend to exercise a more bland territorial control. Finally stand out the Specialty gangs, whose existence is essentially due to purely criminal rather than social reasons; the size of the specialty gangs would be reduced and the scope of interest related only to that area in which they develop their criminal intentions.

A typical example, according to the researchers, would be the drug dealing groups or skinheads. In the last few years, a research movement proposes a return to a theoretical orientation based on resistance and which is inspired by literature not generally contemplated by traditional criminology, in a decided countertendency with respect to the dominant criminological perspective that places the “youth gangs” with a view to pathology and social reproduction. According to this perspective, social reproduction, although it may actually be useful to describe some or even the majority of gangs, cannot be able to explain them all, thus excluding several local or even transnational experiences (Brotherton, 2015).

As numerous empirical researches show, the practices of multiple street organizations contribute to generating specific situations of resistance/transformation of the social order and the dominant cultural, and are far from being explained in terms of mere dysfunction or reproduction (Cannarella, Lagomarsino, Queirolo Palmas 2007).

It is in this perspective, Barrios and Brotherton (2004) propose replacing the terms “gang” or “youth gang” with that of “street organizations”; the latter are: groups formed largely by young people and adults from marginalized classes, whose goal is to provide their members with an identity of: resistance, an

opportunity for empowerment, both individually and collectively, a possibility of voice capable of challenging the dominant culture, a refuge from the tensions and sufferings of everyday life, and finally a spiritual enclave where rituals considered sacred can be developed and practiced.

III. METHOD

Several studies and researches show that official statistics fail to capture and represent the phenomenon of juvenile delinquency or the actual trend in function of the submerged crimes (the so-called "obscure number"); it is estimated that around 90% of illegitimate behaviors would remain unknown. The concealment index measures the ratio between unregistered crimes and those committed; the most heinous crimes turn out to be those most denounced, making the indicator assume a value of 1; on the other hand, minor crimes record high levels of omission of the complaint. Crimes such as theft and assault against weak subjects fall into this category. The objective of this work is to develop an integrated analysis on minors reported to the Public Prosecutors at the Juvenile Courts based on the latest ISTAT data. The surveys carried out by ISTAT on the data of the judicial offices complete the system of juvenile criminal detections allowing to estimate, as far as possible, the total of the phenomenon of deviant youths included in groups. The ISTAT surveys allow an excellent description of the phenomenon of group juvenile crime and an element of comparison for the planning of active law enforcement policies; in fact, the survey carried out by ISTAT, based on data obtained from the judicial offices, allows for the quantification of the total number of minors for whom the crime report is recorded in the register of the Public Prosecutor's Office for minors.

The objective of the present work was to provide a theoretical framework integrated with the statistical variables in order to allow the construction of an analytical framework to combat discomfort and encourage the social integration of young people belonging to the group. In this perspective, the research stems from the growing importance that the theme of youth violence is acquiring especially in the media, following the use of technological forms of diffusion of forms of violence that are difficult to be immediately understood by adults; consider, for example, the methods of harassment and violence through web devices such as cyberbullying.

The specific analysis target is set in adolescents aged between 11 and 18; the analysis relating to this segment takes into consideration the reports referring to minors in an attributable and non-attributable age. Most of the minors are in the 14-17 age group, which constitutes more than 80% of the total, and in the last year under review was up (+ 11%) compared to the 2013-2015 three-year period.

The analysis of this kind shows that the number of children reported is mainly male. According to the "Report of the Ministry of the Interior on the state of security in Italy", juvenile crime in our country, after a period of decline in the years 2000 and 2001, is slowly but steadily increasing. The intervention models are closely related to welfare policies and the social context; in this last case the general evaluation of deviance and sanction is important, that is, how the social context considers the rule, the norm, the transgression and the offense.

The total number of minors subjected to proceedings in 2015, the latest figure available, is equal to 9339. This figure makes it possible to assess a situation in terms of minors subjected to partially positive criminal proceedings with reference to the two-year benchmark (2013-2014). On the other hand, minors who are not responsible report a growth in the last three years (Tab. 1).

Table 1 - Number of proceedings

Year	2013			2014			2015			
	Municipality	Capital city	Not Capital City	Total	Capital city	Not Capital City	Total	Capital city	Not Capital City	Total
Type of crime										
crimes against the person		394	674	1078	418	731	1159	464	727	1199
crimes against life		..	4	4	1	3	4	5	4	9
voluntary murder		..	4	4	..	1	1	4	1	5
consummate homicide		..	1	1	..	..	..	1	..	1
attempted voluntary murder		..	3	3	..	1	1	3	1	4
manslaughter		1	1	1	2	3
crimes against individual safety		244	393	640	240	421	662	252	392	648
beating		44	61	105	36	73	109	50	82	132
voluntary personal injury		195	310	507	202	320	523	200	293	497
negligent personal injury		11	23	34	4	27	31	9	23	32
brawl		4	20	25	11	13	24	6	10	16
crimes against honor		102	161	266	92	187	281	100	199	302
insult		83	138	222	79	167	246	84	173	260
defamation		18	26	46	14	22	38	17	34	51
crimes against moral freedom		108	180	288	121	194	315	144	217	363
threat		77	135	212	80	144	224	95	152	248
stalking		15	16	31	24	24	48	29	33	62
private violence		22	39	61	24	35	59	27	40	68
crimes against the inviolability of the home		14	34	50	14	23	39	10	10	20
violations of domicile violation		10	28	38	4	17	21	4	8	12
cyber abuse		5	5	12	10	5	17	6	1	7
unauthorized interceptions, interruptions and falsifications of electronic communications		1	..	1	..	..	..
crimes against public morality and morality		5	4	9	6	8	14	3	7	10
crimes against the feeling of animals		1	5	6	2	10	12	3	4	8
property crimes		1081	1003	2094	1041	936	1986	1024	793	1823
theft crimes		850	653	1507	789	548	1340	803	480	1285
simple and aggravated theft		707	504	1215	664	450	1116	673	385	1060
attempted simple and aggravated theft		137	62	199	129	55	185	152	59	212
robbery		52	28	80	63	38	101	57	35	92
damage to property, animals, land, etc.		113	245	359	114	242	359	101	187	288
crimes against property through fraud		76	118	199	87	121	211	73	118	195
scam crimes		2	3	5	..	4	4	..	3	3
fraud		1	1	2	..	1	1	..	2	2
misappropriation of property		6	7	13	9	9	18	5	10	15
stolen		63	100	168	76	99	177	66	94	164
money laundering offenses		4	6	10	4	9	14	2	10	12
violence, resistance, insulting a public official		49	39	88	34	37	71	47	16	63
crimes related to the protection of one's own reasons in an arbitrary manner		..	1	1	1	2	3	1	..	1
crimes against religious denominations		..	2	2	..	1	1	..	..	..
crimes against public order		2	1	3	1	..	1	2	1	4
criminal association		..	1	1	1	..	1	1	..	1
crimes against public safety		8	33	41	17	37	54	12	38	50
other violations of the rules on:	
violations of the rules on weapons and explosives		2	3	5	1	4	5	3	5	8
immigration		1	..	1	..	..	..
smuggling		1	..	1	..	..	..
narcotics and psychotropic substances		23	32	57	34	45	79	47	50	98
protection of personal data (privacy)		..	2	2	2	3	5	2	1	4
traffic violation		1	2	3	1	..	1	..	2	2

Data extract 02 dic 2019 11:42 UTC (GMT) da I.Stat

For minors, the use of detention as a response to deviance is seen as an extremely residual measure. Child services, within the criminal jurisdiction of the juvenile judicial authority, contribute to the promotion and protection of young people's rights. Their task does not end at the age of 18 but extends to "young adults", that is to those who have reached the age of majority, but were still minors at the time of the committed crime¹.

Young minors who committed crimes in 2016 (Table 2) were 32,335, down 9.4% compared to the previous year. A characteristic element is that 25.7% are foreigners, while girls are 11%.

At the end of 2017 (Table 3), 999 young people are present in the communities, a figure that is up by 16.2 percent compared to the previous year. In eight percent of the cases they belong to the age group between 14 and 15, while the others are divided almost exactly between 16-17 year olds and adults. Contrary to those in the community, those present in penal institutions for minors (PIM) in 2017 are instead decreasing (they are 425, 8.0 percent less than in 2016). Currently in penal institutions for minors there are more "young adults" (this category now includes the 18-24 year olds) than under age: in fact, at the end of 2017, 57.4 percent (64.8 percent among Italians and 48.4 percent among foreigners).

Entry into first reception centers occurs almost exclusively due to arrest in flagrante delicto (92.6 per cent of cases), while that in the community is mainly arranged by direct application of this precautionary measure (54.5 per cent), in lower proportion for the application of the probation (19.5 percent), or for the end of the worsening period in PIM or for the transformation of a more serious measure, i.e. the juvenile penal institution (a total of 20.6 percent cases). Entries in the PIM take place in 72.4 percent of cases for precautionary custody purposes and in the remaining 27.6 percent for execution of the sentence. Almost half of the entries in the PIM (47.9 percent) concern foreign citizens and 11.2% girls.

The crimes committed by minors entering residential services (CPA, Community, PIM) of juvenile justice (Table 3) are mainly against property or the person, or violations of laws on drugs. In particular, the crimes that led to a greater degree of entry into PIM (the most restrictive personal precautionary measure), are 58.5% of cases of crimes against property, 20 in 17.2% against the person and in 12% of crimes related to drugs. For foreign minors, and particularly for foreign girls, crimes against property are even more the reason for entry into PIM (66.7 and 89.8 % of cases, respectively).

Table 2 - Crimes of known authors under the age of 18 by type of definition by the judicial authority and type of crime - Year 2016

[1] YEARS	[3] Archived crimes	[4] Crimes for which criminal proceedings have begun	[5] Total	[6] Per 100.000 minor
[2] TYPES OF CRIMES				
[7] 2012	[8] 17.648	[9] 22.462	[10] 40.110	[11] 1.798,52
[12] 2013	[13] 16.434	[14] 20.160	[15] 36.594	[16] 1.622,05
[17] 2014	[18] 16.176	[19] 18.259	[20] 34.435	[21] 1.506,22
[22] 2015	[23] 15.866	[24] 19.518	[25] 35.384	[26] 1.541,15
[27] 2016 – per delicts				
[28] Voluntary homicide consumed	[29] 17	[30] 16	[31] 33	[32] 1,44
[33] Voluntary attempted murder	[34] 5	[35] 34	[36] 39	[37] 1,70
[38] Manslaughter	[39] 12	[40] 18	[41] 30	[42] 1,31
[43] Roadside murder	[44] 1	[45] 2	[46] 3	[47] 0,13
[48] Beatings	[49] 655	[50] 251	[51] 906	[52] 39,45
[53] Voluntary personal injury	[54] 1.735	[55] 2.047	[56] 3.782	[57] 164,68
[58] Neglected injuries	[59] 347	[60] 79	[61] 426	[62] 18,55
[63] Road injuries	[64] -	[65] 2	[66] 2	[67] 0,09
[68] Insult	[69] 835	[70] 148	[71] 983	[72] 42,80
[73] Threat	[74] 1.086	[75] 914	[76] 2.000	[77] 87,09
[78] Brawl	[79] 137	[80] 210	[81] 347	[82] 15,11
[83] Private Violence	[84] 127	[85] 208	[86] 335	[87] 14,59
[88] Slander	[89] 96	[90] 68	[91] 164	[92] 7,14
[93] Defamation	[94] 151	[95] 88	[96] 239	[97] 10,41
[98] Maltreatment in the family	[99] 85	[100] 150	[101] 235	[102] 10,23
[103] Stalking	[104] 190	[105] 106	[106] 296	[107] 12,89
[108] Theft	[109] 2.237	[110] 3.335	[111] 5.572	[112] 242,62

¹ Law Decree dated June 26, 2014, No. 92, converted with amendments into Law August 11, 2014, no. 117.

[113]Damage	[114]839	[115]729	[116]1.568	[117]68,28
[118]Robbery	[119]254	[120]773	[121]1.027	[122]44,72
[123]Extortion	[124]68	[125]159	[126]227	[127]9,88
[128]Fraud	[129]129	[130]147	[131]276	[132]12,02
[133]Web Fraud	[134]3	[135]7	[136]10	[137]0,44
[138]Fraud in obtaining certificates issued by the criminal record court and their improper use	[139]19	[141]82	[143]101	[145]4,40
[147]Misrepresentations or statements about your own or others' personal identity or qualities	[148]293	[150]361	[152]654	[154]28,48
[156]Violation of weapons regulations	[157]34	[158]96	[159]130	[160]5,66
[161]Violation of laws on drugs and psychotropic substances	[162]1.670	[164]1.820	[166]3.490	[168]151,97
[170]Sexual violence	[171]332	[172]204	[173]536	[174]23,34
[175]Violation of immigration rules	[176]21	[177]57	[178]78	[179]3,40
[180]Receiving	[181]559	[182]1.215	[183]1.774	[184]77,25
[185]Criminal association	[186]11	[187]12	[188]23	[189]1,00
[190]TOTAL (a)	[191]14.670	[192]17.665	[193]32.335	[194]1.407,97

(a) Source: Elaboration on ISTAT Data

Table 3 - Crimes against minors entering the residential services of juvenile justice by citizenship and sex of the authors, type of service and crime Year 2017

[1]	[2] Italian				[3] Foreign				[4] Total			
[5]	[6] T	[7] %	[8] of which	[9] T	[10] %	[11] of which	[12] T	[13] %	[14] of which			
	o		female	ot		female	ot		female			
	ta			al			al					
	l											
[15]	[16]	[17]	[18] Tot	[19] %	[20]	[21]	[22] Tot	[23] %	[24]	[25]	[26] To	[27] %
			al				al				tal	
[28]	RECEPTION CENTRES											
[30] Against the person	[31] 9	[32] 11	[33] 3	[34] 5,	[35] 8	[36] 9,6	[37] 5	[38] 2,	[39] 1	[40] 10,	[41] 8	[42] 3
	5	,5		7	2			7	7	5		,
									7			4
[43] Against the Estate	[44] 3	[45] 47	[46] 31	[47] 5	[48] 6	[49] 70,3	[50] 172	[51] 9	[52] 9	[53] 58,	[54] 20	[55] 8
	9	,0		8,	0			3,	9	9	3	5
	0			5	3			0	3			,
												3
[56] Violation of the provisions on drugs	[57] 2	[59] 31	[61] 16	[63] 3	[65] 9	[67] 11,1	[69] 2	[71] 1,	[73] 3	[75] 21,	[77] 18	[79] 7
	6	,8		0,	5			1	5	3		,
	4			2					9			6
[81] Infringement of the provisions on arms	[82] 4	[84] 4,	[86] -	[88] -	[90] 3	[92] 0,3	[94] -	[96] -	[98] 4	[100] 2,6	[102] -	[104] -
	1	9							4			
[106] Resistance, violence, outrage to a public official	[107] 2	[109] 3,	[111] 3	[113] 5,	[115] 2	[117] 3,4	[119] -	[121] -	[123] 5	[125] 3,2	[127] 3	[129] 1
	5	0		7	9				4			,
												3
[131] Other crimes	[132] 1	[133] 1,	[134] -	[135] -	[136] 4	[137] 5,4	[138] 6	[139] 3,	[140] 6	[141] 3,6	[142] 6	[143] 2
	4	7			6			2	0			,
												5
[144] Total	[145] 8	[146] 10	[147] 53	[148] 1	[149] 8	[150] 100	[151] 185	[152] 1	[153] 1,	[154] 100	[155] 23	[156] 1
	2	0		0	5			0	6		8	0
	9			0	8			0				0

[406] Total (a)	[407] 1	[408] 10	[409] 58	[410] 1	[411] 9	[412] 100	[413] 137	[414] 1	[415] 2	[416] 100	[417] 19	[418] 1
	2	0		0	0	100	0		1		5	0
	9			0	3		0		9			0
	0								3			

(a) Source: Elaboration on ISTAT Data

Table 4 – Crimes of juvenile group divided for age (Years 2010-2015) (Source: Tribunale dei Minori)

Group Number	Age					Total
	< 14	14	15	16	17	
One person	59.5	45.5	47.2	51.6	64.4	54.5
Two person	24.6	23.8	22.5	20.6	19.6	21.8
Three person	8.2	12.8	11.5	12.2	7.7	10.3
Four person	3.9	6.9	6.1	6.4	3.2	5.2
More than five	3.8	11.0	12.6	9.3	5.0	8.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
N.	613	508	720	987	962	3790

Table 5 - Crimes of juvenile group divided for birth places (Years 2010-2015) (Source: Tribunale dei Minori)

Group Number	Birth Places		Total
	Italy	Foreign	
One person	51.5	61.3	54.5
Two person	21.5	22.5	21.8
Three person	11.5	7.6	10.3
Four person	6.4	2.4	5.2
More than five	9.0	6.2	8.2
Total	100.0	100.0	100.0
N.	2643	1147	3790

From the analysis of data on Juveniles reported up to 2015, according to the type of crime, a prevalence of crimes against property is observed (especially theft). Crimes against the person follow, in order of frequency, characterized mainly by voluntary personal injury. The number of violations concerning drugs is also relevant, while the number of crimes against the family, public morality and morality, those against the State, social institutions and public order are minor.

With reference to the nationality of minors, for both Italians and foreigners the prevalence of crimes against property is confirmed, with a lower percentage incidence in the former (55% of the total crimes of Italians) than in the latter (76% of the total of crimes of foreigners) (Table 4-5). On the contrary, violations of the provisions on drugs and crimes against the person have a higher percentage incidence among Italians (respectively 31% and 7%). Still observing the data relating to the complaints, it can be noted that the percentage of minors involved in crimes against property decreases with age, in favor of other types of crimes such as those against the state and public order and violations of the law on the subject of drugs. Furthermore, it can be observed that infra-fourteen-year-old minors and those aged between fourteen and fifteen years record higher than average percentages with reference to crimes against property. For children between the ages of sixteen and seventeen, the percentage referring to crimes against security and public faith is higher than the average, while that of property crimes is lower than the average.

IV. CONCLUSIONS

Data from Juvenile Justice Offices contradict many of the clichés about adolescents. It is not true that criminal activity has increased, it is not true that it is connected with foreign minors. On the contrary, the criminal activity is in decline both at the child and adult level, as well as the number of foreigners involved.

It must be acknowledged that the perception of public opinion is often influenced by the mass media which amplify certain crimes. It should also be noted that the crimes, in recent years, have been strongly concentrated against property and against the person: crimes that mainly affect ordinary people. There can be doubts about the exact representation of the phenomenon on the basis of the data provided, as many crimes, especially less serious ones, are not even reported and the number of those registered often depends on the type of tolerance or addiction to crime, on the part of the society.

Gangs have existed in Italy since the 1950's. Nowadays there are very few gangs in Italy. The increase in juvenile delinquency (theft, vandalism and assaults) that Italy is facing has led to a general social perception of violent criminal juvenile gangs. However, "it is not necessarily linked to gang activity"; in fact, "the reality of the problem is possibly not as great or as serious as the media portrays as there are actually not that many

gangs in existence throughout the country” (Brutto & Minesso, 2013). Brutto and Minesso study would be in tune with the aforementioned and that is that the gang phenomenon exists but is partly built by the media, so much so that making use of press reports allows us to perceive the extent of this media construction (Di Nicola, 2007). In this regard, referring to the research conducted by various study centers, it is a media construction of aggregation and socializing practices of young people under the homogeneous and stigmatizing label of the “gangs” engaged in criminal activities. In any case, a useful invitation to reflection is that proposed by Cerbino, who states that the phenomenon of the bands leads us to consider the need to rethink the other, even in a context marked by conflict, perceiving it not as an enemy but as an adversary, as a guarantee for the expression of a plurality of positions and for the unfolding of free play among social actors (Cerbino, 2005). The author also underlines how it is possible to articulate effective responses only if we contribute to generating spaces of speech and expression, of circulation of ideas, of reflection on the meanings of life for society and youth. In order for public policies aimed at young people to be effective, it is necessary to start from the symbolic horizons peculiar to the youth worlds. Grasping the meanings, the reasons and the representations that form the background to the birth of the bands as a specific youth world, to seek solutions referring to the structural causes (many of which are emotional) and not to the manifest and contingent problems. In fact, the institutions' actions, to become effective, must incorporate the profound meanings of the bond and cohesion, of the emotional community that the bands structure, horizons of meaning that many young people no longer find in the normal spaces of everyday life.

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Modeling of The Lane Changing Motor Vehicle Traffic On Roads with Two Lanes

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Abstract: *Heterogeneous motor vehicle flow models are developed to take into account of local and major changes such as the increase of motor vehicle types and number, increase of the number of lanes, lane shifting characteristics, overtaking and identification of areas prone to accidents and congestion. Lighthill - Whitham and Richards motor vehicle traffic model, investigated how homogeneous vehicles travels in a one dimensional, single lane road; without curvatures. Petrosyan and Balabanyan, in their headway traffic flow model, demonstrated how overtaking of a lead vehicle is difficulty in a single lane road. Due to the potholes realized in the already existing motor vehicle traffic flow models, there was need to work with heterogeneous traffic flow models so as to take care of dimensional heterogeneity, road heterogeneity and vehicle heterogeneity. This study addresses the short falls of the old models and the challenges posed by the increase in motor vehicle traffic ranging from but not limited to head on collisions, head to back collisions, lane changing difficulties, congestion and pedestrian related accidents not forgetting lack of maneuvering space for negotiating sharp corners; such as the Nyabunde black spot corner, in Kisii, Sachangwan deadly stretch, in Nakuru; both in Kenya where deadly accidents have in the recent past occurred resulting to loss of life and property. The study developed heterogeneous motor vehicle traffic flow models, derived a two ensemble traffic composition formulation and established the solutions to the obtained models numerically. Graphical representation of the traffic flow variables with respect to the distance covered on the highway is done using MATLAB. The information obtained from the study is very useful to civil engineers, mechanical engineers, town planners, computer programmers and upcoming mathematicians not forgetting drivers and riders.*

Key words: Lane, multi – lane, Dual – carriage, Lane function, and Lane changing model

Abbreviations: Two dimension (2D), Lane position (C), and Lighthill-Whitham-Richards (LWR)

1. Introduction

Traffic networks that consist of avenues, highways, lanes, streets and other roadways provide a convenient and an economical conveyance of passengers and goods. The basic activity in transportation is a trip, defined by its origin/destination, departure time/arrival time and travel route. A myriad of trips interact on a traffic network to produce a sophisticated pattern of traffic flows [2]. Nowadays traffic jam has become a major problem in society and economically as far as transportation in developed and developing countries; where our country Kenya as member is considered [8]. In the last few decades much interest has been focused on traffic flow models as the amount of traffic more especially motorcycles continues to increase exponentially [7]. Traffic congestion on motorways in the third world countries is becoming an even more pressing problem, where almost in every weekday morning and every weekday evening including weekends the capacity of many main roads is exceeded [3]. Traffic management is becoming a mounting challenge for many cities and towns across the globe as the world's population grows. Increasing attention as been devoted to the modeling, simulation and visualization of traffic to investigate causes of traffic accidents, congestion and delays, to study the effectiveness of road side hardware, signs and other barriers, to improve policies and guidelines related to traffic regulation and to assist up in development and the design of highways and road systems. The transportation is one of the major pillars supporting live in cities and regions in many large cities. The potentialities of extensive development of the transportation network were exhausted over the last five decades or are approaching completion. That is why optimal planning of transportation, improvement of traffic organization and optimization of the roots of public conveyance take on special importance. Solution of these problems cannot do without mathematical modeling of the transportation systems. In this study the work of [4, 6] is extended into a two lane change model. The derivation of the multi – lane road model is presented as well as the lane shifting model for a road with two lanes. The lane changing model is consists of a system of partial differential equations (PDE). It is almost impossible to find the exact solution of the model as an initial value (IVP). That is why there is demand to find the numerical solution of the model as an initial boundary

value problem (IBVP). For numerical solution of the model we describe the derivation of the numerical schemes. In order to implement the numerical scheme. The study develops a computer programming codes and performs computer simulation of the lane changing model using MATLAB with respect to various flow parameters.

2. Literature Review

The most relevant literature, is the one done by [4], in his study of highway capacity of short dense - roads formulated a motor vehicle traffic model. The model only gave the relationship between motor vehicle velocity during free flow and during a traffic jam and could not account for how the road characteristics can influence traffic flow velocity. This occasioned Michalopoulos study later on in addressing this deficiency; which finally led to Michalopoulos traffic flow model. [5] in their investigation of a two-way traffic flow road section developed a traffic flow model containing road characteristics of the road section in question. The most elementary continuum traffic flow model was the first order model developed by [4, 6], based around the assumption that the number of vehicles is conserved between any two points if there are no entrances (sources) or exits (sinks). This produces a continuum model known as the Lighthill-Whitham-Richards (LWR) model.

3. Multi – Lane Road Model

3.1 Definition

A road is a way used for traveling between places, towns, cities and homes. They are usually surfaced by tarmac, asphalt, marram or concrete. Roads in developing countries; both rural and urban are designed to accommodate many and different types of vehicles; traveling in either direction, this has been the case for about 400 years ago. Comparatively, a lane is a single vehicle path. For a single road, one way, a lane width is equal to the road width. The most current roads have at most four lanes on both the RHS and LHS constituting a dual carriage highway. In this context a lane width is a quarter the road width. On a two dimensional, multi - lane road, the road function is derived from the respective velocity components. The velocity components in the respective x and y directions are given as;

$$u = \frac{dx}{dt} \tag{1}$$

In the y - direction;

$$v = \frac{dy}{dt} \tag{2}$$

Then, the differential equations representing the lanes is given as;

$$dt = \frac{dx}{u} = \frac{du}{v} \tag{3}$$

On mathematical manipulation this is expressed as;

$$vdx - udy = 0 \tag{4}$$

It is clear that, this equation is an exact differential of two independent variables. Let the multi - variate, multi - lane function be represented by the function;

$$\Psi = \psi(x, y) \tag{5}$$

$\Psi = \psi(x, y)$ is the multi - lane function

Since $\Psi = \psi(x, y)$ is a function of two independent variables then; it is exact differential is given as;

$$\Psi = \psi(x, y) = \frac{\partial \psi(x, y)}{\partial x} dx + \frac{\partial \psi(x, y)}{\partial y} dy \tag{6}$$

Comparing equation (4) and equation (6); we realize that,

$$\Psi = \psi(x, y) = \frac{\partial \psi(x, y)}{\partial x} dx + \frac{\partial \psi(x, y)}{\partial y} dy = vdx - udy = 0 \tag{7}$$

Implying that,

$$\Psi = \psi(x, y) = 0 \tag{8}$$

after taking integrals on both sides, the multi - lane road function is taken to be constant, C; that is to say

$$\Psi = \psi(x, y) = \text{constant, } C \tag{9}$$

However, the lane function is partially constant and partially varies as y; in the positive y - direction, hence;

$$\Psi = \psi(x, y) = \text{constant, } C + ky \tag{10}$$

Where C and k are constants; with C representing the lane position from the left hand side and k representing the lane width; in most of the developing countries, the lane-width $k = 3.0\text{m}$, y is the lane position, whose integral values are expressed as; $y = 0, 1, 2, 3, 4$ for a four lane road. This equation (10) is the multi-lane road function in a 2D.

3.2 The Lane Shifting Traffic Flow Model

Typically, continuum models are based on a system of motor vehicle conservation laws. In this derivation, the study used a dual carriage highway with N lanes on either road; which are numbered as, $j = 1, 2, 3, 4, \dots, N$. The lane changing motor vehicle traffic flow model between lane 1 (subscript 1) and lane 2 (subscript 2) based on the extension of LWR model, having a source and a sink; in a generalized form is expressed as:

$$\left. \begin{aligned} \frac{\partial \rho_1}{\partial t} + \frac{\partial(u\rho_1)}{\partial x} &= \frac{\rho_2}{T_2^1} - \frac{\rho_1}{T_1^2} \\ \frac{\partial \rho_2}{\partial t} + \frac{\partial(u\rho_2)}{\partial x} &= \frac{\rho_1}{T_1^2} - \frac{\rho_2}{T_2^1} \end{aligned} \right\} \tag{11}$$

This is the lane changing that occurs between the first two lanes. For any middle lane j, the lane shifting model becomes;

$$\frac{\partial \rho_j}{\partial t} + \frac{\partial(u\rho_j)}{\partial x} = \frac{\rho_{j-1}}{T_{j-1}^j} - \frac{\rho_j}{T_j^{j-1}} + \frac{\rho_{j+1}}{T_{j+1}^j} - \frac{\rho_j}{T_j^{j+1}} \tag{12}$$

The lane vehicle exchange between the last two lanes, that is N-1 and N; is given by the equations;

$$\left. \begin{aligned} \frac{\partial \rho_{N-1}}{\partial t} + \frac{\partial(u\rho_{N-1})}{\partial x} &= \frac{\rho_N}{T_N^{N-1}} - \frac{\rho_{N-1}}{T_{N-1}^N} \\ \frac{\partial \rho_N}{\partial t} + \frac{\partial(u\rho_N)}{\partial x} &= \frac{\rho_{N-1}}{T_{N-1}^N} - \frac{\rho_N}{T_N^{N-1}} \end{aligned} \right\} \tag{13}$$

Where the subscripts, $j = 1, 2, 3, 4, \dots, N-1$ and N refers to the number of lanes. The quantities ρ_j, v_j and $q_{\{j\}} = \rho_j \times v_j$ are the motor vehicle densities, vehicle velocities and flux in j^{th} lane respectively. At last $T_j^k(\rho_j, \rho_k)$ is the vehicle transition from the j^{th} to the k^{th} lane; such that; $|j - k| = 1$.

4. Solution of the Lane Changing Model

In particular, a macroscopic, lane changing motor vehicle traffic flow model for a road with two lanes as given by the system of equations (13); were numerically solved as illustrated below;

$$\left. \begin{aligned} \frac{\partial \rho_1}{\partial t} + \frac{\partial(u\rho_1)}{\partial x} &= \frac{\rho_2}{T_2^1} - \frac{\rho_1}{T_1^2} \\ \frac{\partial \rho_2}{\partial t} + \frac{\partial(u\rho_2)}{\partial x} &= \frac{\rho_1}{T_1^2} - \frac{\rho_2}{T_2^1} \end{aligned} \right\} \quad (14)$$

In obtaining the numerical solutions of the coupled system of equations representing the lane changing traffic flow model, the study took the model as an initial boundary value problem (IBVP) by inserting initial and boundary conditions. Finite difference method was used in finding the solution. Density is a function of time, t , lane position and space x . In order to develop the numerical scheme; we discretize the time derivatives using the forward difference in time; and the space derivatives by the central difference in space.

The discretization in time and in space, for lane 1 (subscript 1)

$$\frac{\rho_{1,i}^{n+1} - \rho_{1,i}^n}{k} + \frac{u(\rho_{1,i+1}^n - \rho_{1,i-1}^n)}{2h} = \frac{\rho_{2,i}^n}{T_2^1} - \frac{\rho_{1,i}^n}{T_1^2} \quad (15)$$

and for lane 2 (subscript 2) is given as;

$$\frac{\rho_{2,i}^{n+1} - \rho_{2,i}^n}{k} + \frac{u(\rho_{2,i+1}^n - \rho_{2,i-1}^n)}{2h} = \frac{\rho_{1,i}^n}{T_1^2} - \frac{\rho_{2,i}^n}{T_2^1} \quad (16)$$

These equations are Lax Friedrich Finite difference scheme for our IBVP equation.

Taking the time step, k and step length, h as $h = k = 1$; $u = 80\text{km/hr}$ and the transitions as $T_2^1 = 20$ percent; $T_1^2 = 10$ percent, the numerical scheme for lane 1 becomes;

$$\rho_{1i}^{n+1} = \rho_{1i}^n - 80\rho_{1i+1}^n + 80\rho_{1i-1}^n + 5\rho_{2i}^n - 10\rho_{1i}^n \quad (17)$$

the numerical scheme for lane 2 becomes

$$\rho_{2i}^{n+1} = \rho_{2i}^n - 80\rho_{2i+1}^n + 80\rho_{2i-1}^n + 5\rho_{1i}^n - 10\rho_{2i}^n \quad (18)$$

The lane changing traffic flow model is solved at four time levels that is $n = 0, n = 1, n = 2, n = 3$. Taking $u = 80\text{km/hr}$ into the above scheme, at the time level $n = 0$, the nodal points in the x - direction as $i = 1, 2, 3, \dots, 5$. A system of algebraic equations are obtained. Using the initial condition $\rho(x, 0) = 21/0.1\text{km}$ and boundary conditions as $\rho(0, t) = 5 \cos 2x + 21$, the system of equations generated from the numerical scheme above is solved by matrix laboratory. The results are tabulated in table 1.

Table 1: The lane 1 changing Solutions values

Grid point(i, lane 1, n)	n = 0	n = 1	n = 2	n = 3
(1, 1, n)	25.997000	232.013000	2064.877	17821.333
(2, 1, n)	25.988300	231.972000	1990.468	15330.853
(3, 1, n)	25.973000	230.797000	1960.533	14470.788
(4, 1, n)	25.951000	229.639000	1914.110	13509.641
(5, 1, n)	25.924000	228.423000	1905.244	12998.374

It is seen from the results in Table 1 that for a given value of i, ρ_{1i}^n values tends to increases to infinity as n increases to infinity. Also for a given value of n, ρ_{1i}^n values decreases to its initial density as i increases to infinity. Using the same numerical procedure, lane 2 algebraic system of equations results are generated and recorded as shown in table 2. The results in Table 1 are represented graphically in 2D in figure 1.

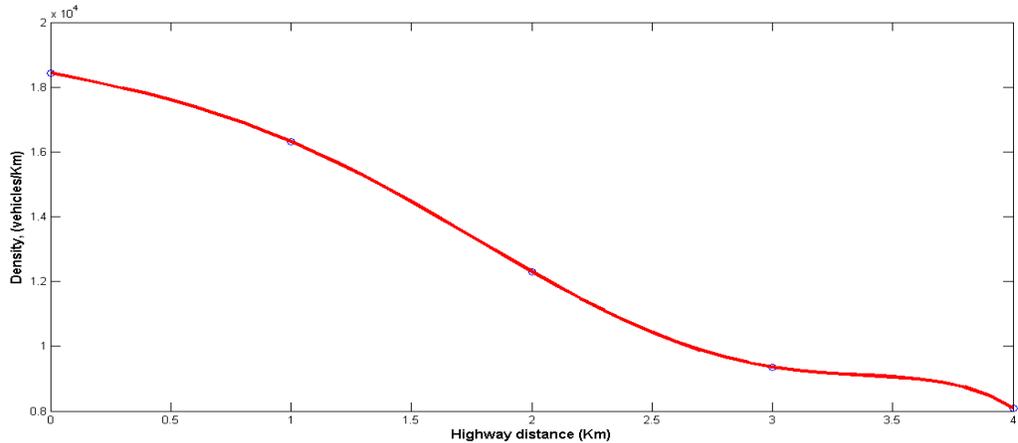


Figure 1: Lane one changing solution values

Table 2: The Lane 2 Changing Solutions Values

Grid point(i, lane 2, n)	n = 0	n = 1	n = 2	n = 3
(1, 2, n)	15.997000	93.028000	1033.67200	18442.472
(2, 2, n)	15.988300	62.032000	1023.55200	16315.128
(3, 2, n)	15.973000	60.932000	718.88000	12303.928
(4, 2, n)	15.951000	50.884000	625.74400	9358.464
(5, 2, n)	15.924000	42.041000	506.25600	8091.496

The results in Table 2 are represented graphically in 2D in figure 2. It is seen from the results in Table 2 that for a given value of i, ρ_{2i}^n values tends to increases to infinity as n increases to infinity. Also for a given value of n, ρ_{2i}^n values decreases to its initial density as i tends to increase to infinity.

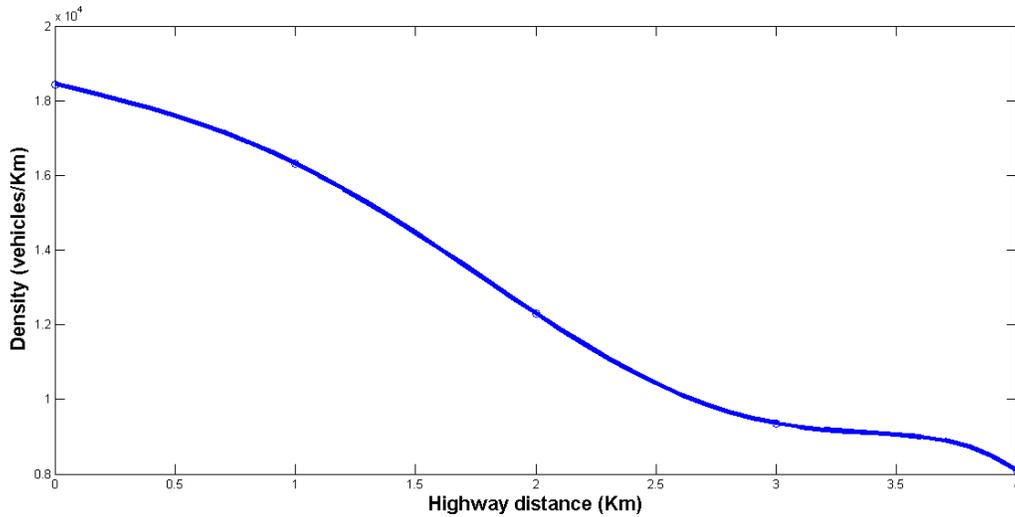


Figure 2: Lane two changing solution values

Additionally, the numerical values for dynamic density, velocity and flux at different time levels for lane 2, between the nodes $i = 4$, $i = 5$, are as illustrated in the table 3;

Table 3: Variation of Density, Velocity and Flux with Time, t

Grid point(i, lane 2, n)	Time, t	Density, ρ	Velocity, u	Flux, q
(5, 2, 0)	0.000	1.08000	79.22000	85.536
(5, 2, 1)	6.000	1.92500	61.80000	119.00
(5, 2, 2)	12.000	4.12000	34.50000	142.14
(5, 2, 3)	18.000	7.80000	16.65600	130.00
(5, 2, 4)	24.000	16.0000	7.500000	120.00

Table 3 shows that when vehicles are few, traffic density is lower, the flux is also lower; the velocity is high as there is maximum vehicle - road interaction. As the number of vehicles increases such that many vehicles passes the fifth nodal point at a relatively high velocity and density; the flow rate is high. At maximum density called jam density, vehicles cannot move; the flux is lower. The results from table 4.5 can be represented graphically in 2D in figure 3 to show the variation of density, ρ with velocity, u and with flux, q, respectively.

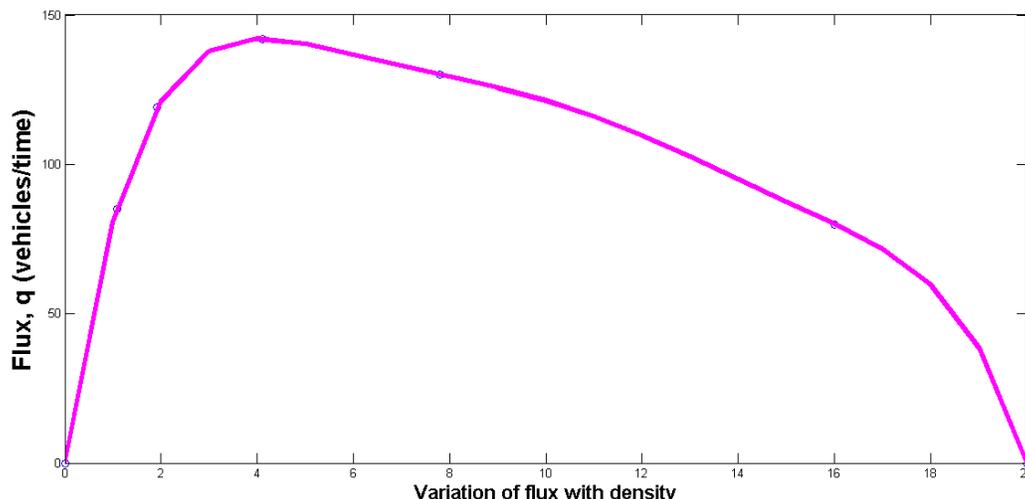


Figure 3: Variation of flux with density

5 CONCLUSION AND RECOMMENDATIONS

5.1 CONCLUSION

Based on the objectives, the study developed heterogeneous motor vehicle traffic flow models focusing on two dimensional heterogeneity and multi - lane road heterogeneity aspects. It established the 2 - ensemble traffic composition formulation using vehicle heterogeneity characteristics in two dimensions. It determined numerical schemes founded on finite difference method to solve the model equations. The method obtained a finite system of linear algebraic equations from the PDE by discretizing the generated PDEs and coming up with the numerical schemes analogous to the equations. The thesis solved the equations subject to the given initial and boundary conditions as per the geometry of the traffic problems as an IBVP. MATLAB software was used to generate solution values in this study and produce 2D graphical representation of the traffic flow variables at different points on the highway. The finite difference technique, used as a solution method in the study, basically involves replacing the partial derivatives occurring in the partial differential equation as well as in the boundary and initial conditions by their corresponding finite difference approximations and then solving the resulting linear algebraic system of equations by a standard iterative procedure. The numerical values of the dependent variables are obtained at the points of intersection of the parallel lines, called mesh points or nodal points.

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The Impact of Pesticide Use on Chili Plants (*Capsicum annum* L.) on Soil Arthropod Diversity with Semi-Organic and Conventional Agricultural Systems in Dau District, Malang Regency, Indonesia

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Abstract- This study aims to determine the impact of the use of pesticides on chili (*Capsicum annum* L.) on the diversity of soil arthropods on land with semi-organic and Conventional farming systems in Dau sub-district, Malang regency, Indonesia. Arthropod sampling was carried out using the pitfall trap method, measuring the abiotic factors of soil temperature, soil pH, air humidity, and light intensity as well as the interview method. Arthropod diversity data analysis was analyzed using Microsoft Excel by calculating the Shannon-Wiener diversity index (H'), evenness (E), dominance index (ID), and taxa richness (TR). Then use the SPSS for Windows release 16 application with the Repeated Measure ANOVA test to determine differences in diversity of soil arthropods in semi-organic and Conventional. Previously the Normality test has been done. Interview results were analyzed descriptively. Arthropods found in the two locations showed different results in semi-organic fields before being sprayed with pesticides, found 10 order and 21 families, semi-organic fields after being sprayed with pesticides, found 10 order and 19 families. Then in Conventional land before spraying found 9 order and 18 families and Conventional after spraying found 9 order and 17. The total of all individuals found in semi-organic and Conventional land was 2008 individuals. Semi-organic land before spraying has the highest diversity value with an average of 3.44, while the lowest is Conventional land after spraying with an average diversity value of 2.10. Semi-organic before spraying compared with semi-organic after spraying a significant value of $1000 > 0.05$ was not significantly different. Conventional before spraying compared to Conventional after spraying showed a significant value of $0.026 < 0.05$ significantly different.

Keywords: Arthropods, Pesticides, Semi-Organic, Conventional

I. INTRODUCTION

Malang Regency is one of the centers of red chili production in East Java Timur [5]. The need for chilies (*Capsicum annum* L.) every year is getting higher with increasing prices, it is estimated that the need for chili will continue to increase, in 2017 it is estimated to be 2.95 kg/capita/year and in 2020 it is estimated to be above 3.10 kg/capita/year. Chili production in 2017 amounted to 2.35 million tons but decreased in 2018 amounted to 2.30 million tons [7]. One of the decreases in chili production is caused by pests and diseases because it can cause losses in both the quality and quantity of chili, so to overcome this, farmers choose synthetic pesticides.

The use of chemical insecticides caused a reduction in the diversity of arthropods in onion cultivation [9]. The use of pesticides greatly affects the structure of the arthropod community and directly influences natural enemies [4]. Excessive use of synthetic pesticides has a very detrimental effect on insect biodiversity, including Arthropods that cause resurgence and even other insects that have important ecological functions such as pollinating insects. The use of pesticides that are very strong and broad-spectrum which is widespread and excessive has resulted in damaging effects [15].

For the environment, the use of synthetic pesticides is likely to cause accumulation of pesticide residues in the soil which takes a long time to be degraded, causing soil pollution. Pesticides have damaged the natural balance of agricultural soils and reduced the diversity of soil arthropods. Another impact arising from inappropriate use of pesticides is that the presence of pollinator insects as pollinating agents is increasingly difficult to find [8]. Several types of pollinating insects (pollinators) of fruit and seed plants on the island of Java are on a critical threshold [1].

Therefore, to create environmentally friendly agriculture, farmers need knowledge about the wise use of pesticides and organic or semi-organic farming systems that have many benefits. At present, there are no studies that distinguish the impact of the use of pesticides by chili farmers (*Capsicum annum* L.) on the diversity of Soil Arthropods in semi-organic and Conventional land in

Dau District. Based on the background above, it is necessary to research the impact of the use of pesticides by chili farmers (*Capsicum annum L.*) on the diversity of soil arthropods and pesticide residues in Dau District.

II. METHODS

The research was conducted in December 2018 - December 2019. Arthropod research and sampling and open interviews were conducted in Sumberbondo, Kucur Village, Dau District, Malang Regency, Indonesia. This research was conducted using a combination of research methods (Mixed Methods). The design of this study uses Sequential Explanatory. The method used first is the open interview technique (interview). The first sampling method is done by using purposive sampling with the number of respondents 10 chili farmers. Farmers who use pesticides on their land are grouped into 2 categories, namely: Semi Organic: A chili farmer who uses a mixture of pesticides, chemical, and vegetables. And Conventional: Chili farmers who only use chemical pesticides. The second sample was taken using the pitfall trap method. The pitfall trap used was a 7 cm diameter glass jar filled with 50 ml of 70% alcohol (functioning as a preservative arthropod). Pitfall traps are installed at random zig-zag [16]. At each location, there are 10 pitfall traps performed 6 times 2 days before spraying and 2 days after spraying. Pitfall trap installation is carried out in the morning at 07.00 WIB. Pitfall traps are installed for 24 hours. Observation and identification of soil arthropods were done based on morphological characteristics [4]. Furthermore, diversity analysis was carried out with the Shannon-Wiener index (H') [2,10], with the following formula:

$$H' = -\sum p_i \ln p_i \dots\dots\dots(1)$$

Explanation : H' = index Shanon-Wiener

N = the total number of individuals, it is the following formula:

Diversity index criteria: $H' < 1$ = low diversity (number of species and individuals low, presence of dominant dominance), $H' = 1-3$ = moderate diversity (number of species and individuals are moderate, number of individuals does not vary), $H' > 3$ = high diversity (the number of species and individuals is high, there is no dominant type).

$$D = \sum_{i=1}^s (p_i)^2 \dots\dots\dots(2)$$

Explanation:

D : Index Dominance Simpson
 P_i : Proporsi species X on jumlah total

$$E = \frac{H'}{H_{max}} \dots\dots\dots(3)$$

Explanation: E : Evenness

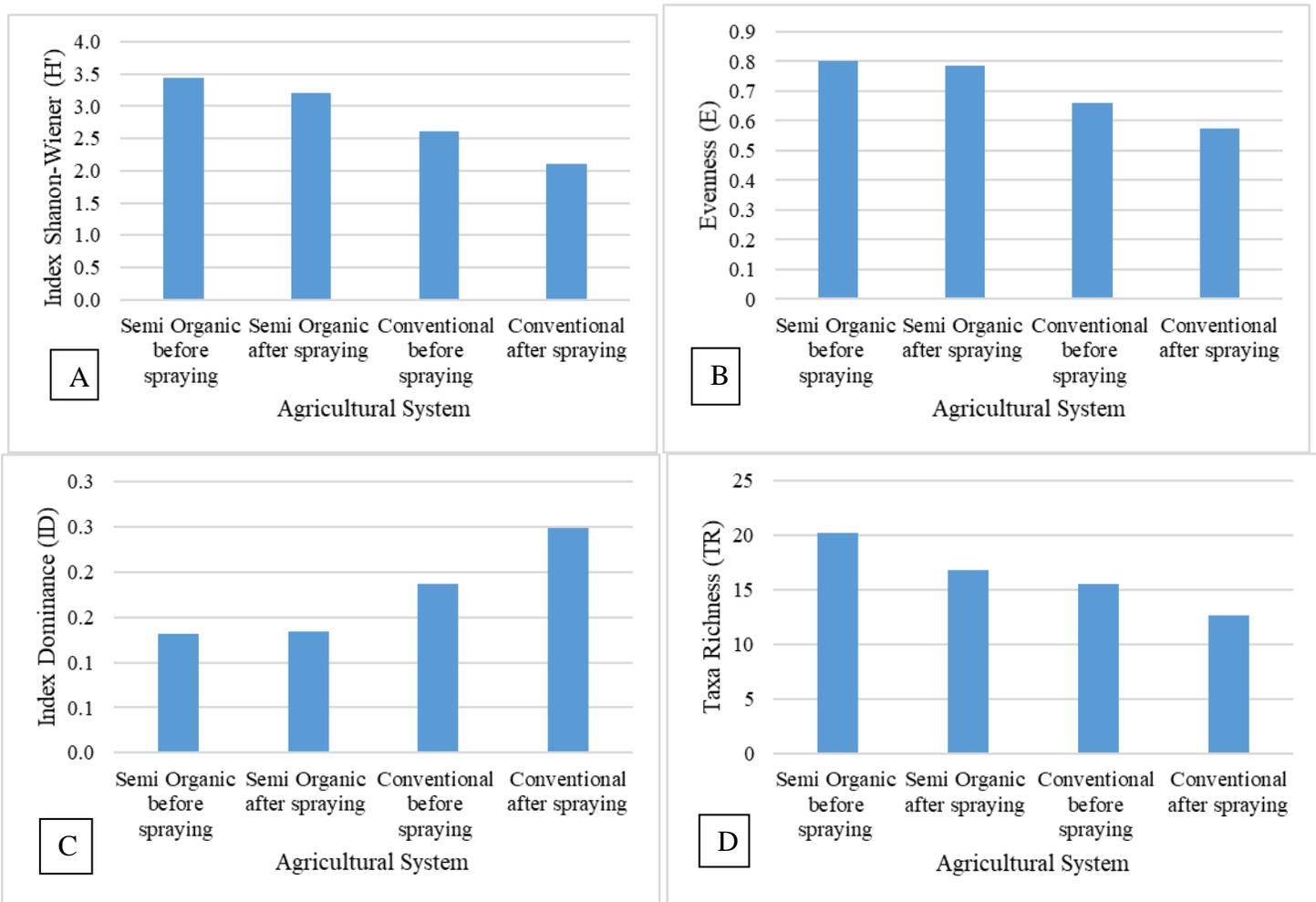
Evenness of species has an E value ranging from 0 - 1. If the value of $E = 1$ means that in the habitat there are no species that dominates, and vice versa if E approaches 0 there is a species that dominates.

$$INP = KR + FR \dots\dots\dots(4)$$

Explanation: KR : Density Relative
 FR : Frekuensi Relative
 INP : Important Value Index

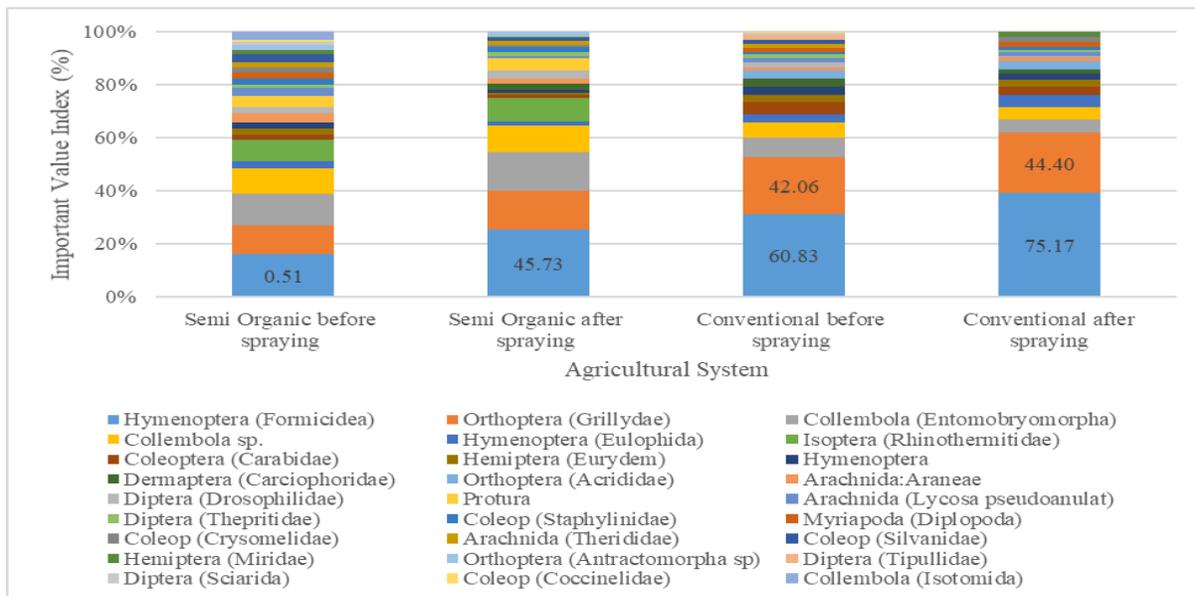
Arthropod diversity data analysis was analyzed using Microsoft Exel. Then use the SPSS for Windows release 16 application with the Repeated Measure ANOVA test to determine differences in diversity of soil arthropods in semi-organic and conventional land. Previously normality and homogeneity tests have been done. Interview results were analyzed descriptively.

III. RESULTS AND DISCUSSION



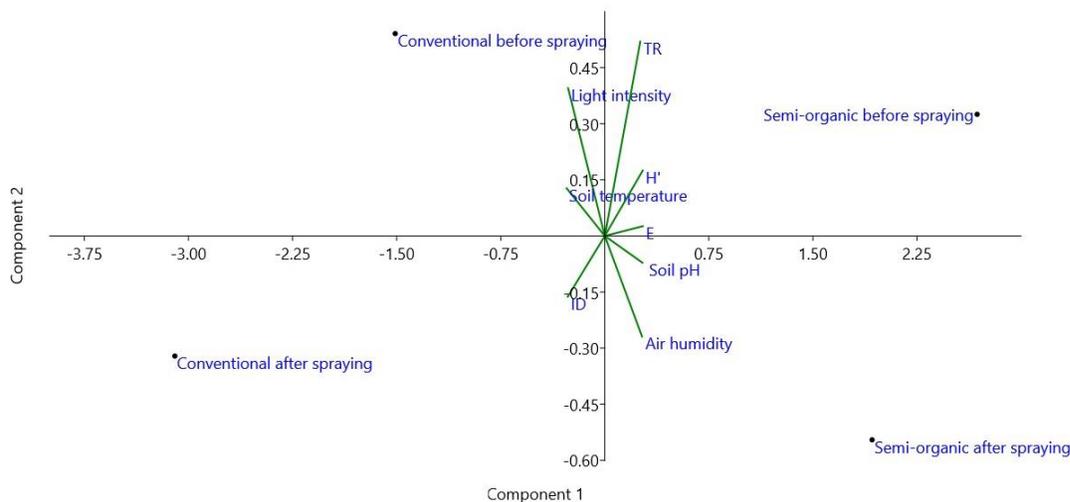
Picture 1. (A) Index Shanon-Wiener (H'), (B) Evenness (E), (C) Index Dominance (ID), (D) Taxa Richness in semi-organic and conventional land before and after spraying pesticides.

Based on the results of data analysis shows that semi-organic land before spraying has the highest diversity value with an average of 3.44, an average evenness value of 0.80, an average taxa richness value of 20.2, and the lowest dominance index 0.13. This shows that semi-organic land before spraying still has a diverse diversity of arthropods, a high number of species and individuals, and no species dominate. While the lowest is conventional land after spraying with an average diversity value of 2.10, an evenness index of 0.57, taxa richness value of 12.7, and the highest dominance index value is an average of 0.25. This is because the pesticides used in semi-organic fields are chemical pesticides mixed with vegetable pesticides and organic fertilizers so that the killing rate of the arthropods is still low and the availability of arthropods food is also high because many organic materials are contained in the soil. Organic material from fertilizer is a food source for microarthropods or mesoarthropods [17]. The use of synthetic pesticides has an impact on arthropods such as a decrease in natural enemy populations, pest resistance, and pest resurgence [6]. That the more types of insects and the more evenly distributed of each type of insect, the higher the diversity [13]. States that the total population of a families that does not dominate other families, the evenness value will tend to be high and vice versa if a families has a population that dominates the number of other populations then the equality will tend to below [18].



Picture 2. Important Value Index (%)

Based on picture 2, the important value index of all agricultural systems having the highest INP value is Formicidae. In semi-organic fields before spraying, the average value of formicidae was 0.51%, whereas in semi-organic fields after spraying, they showed formocidae of 45.73%. On conventional land before spraying showed an average value index of 60.83%, while on conventional land the average value of the index was 75.17%. The results of this study indicate that the two locations have the same community structure. The abundance of formicidae in both locations is due to their clustered habitat. Most order of the Hymenoptera, especially the formicidae group, have many types that act as predators of insect pests [4]. They show great diversity and increased the complexity of behavior in terms of a social organization so that their existence is almost everywhere.



Picture 3. Biplot analysis.

Based on *Biplot* analysis, it is known that semi-organic land before spraying and after spraying is influenced by microclimate factors, namely air humidity, and soil pH, but it is less affected by light intensity and soil temperature. This group has a high index value of diversity, evenness, and taxa richness and a low dominance index. In the second group, conventional land before spraying and after spraying are affected by light intensity and soil temperature but are slightly affected by soil pH and humidity. This group has a high dominance index.

Tabel 1. Pairwise comparisons of semi-organic and conventional land before and after spraying pesticides.

Pairwise Comparisons

Measure: Spraying							
(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig. ^a	95% Confidence Interval for Difference ^a		
					Lower Bound	Upper Bound	
1	2	.600	.452	1000	-.635	1.835	
	3	2.250*	.485	.000	.927	3.573	
	4	3.450*	.467	.000	2.176	4.724	
2	1	-.600	.452	1000	-1.835	.635	
	3	1.650*	.418	.001	.510	2.790	
	4	2.850*	.385	.000	1.798	3.902	
3	1	-2.250*	.485	.000	-3.573	-.927	
	2	-1.650*	.418	.001	-2.790	-.510	
	4	1.200*	.404	.026	.097	2.303	
4	1	-3.450*	.467	.000	-4.724	-2.176	
	2	-2.850*	.385	.000	-3.902	-1.798	
	3	-1.200*	.404	.026	-2.303	-.097	

Based on the analysis of *Repeated Measures* ANOVA, it shows semi-organic before spraying (1) compared to semi-organic after spraying (2) the average decrease in arthropod abundance is 0.600, and the difference in decrease is not significant because the significant value is $1000 > 0.05$. This is because spraying in semi-organic agriculture uses chemical pesticides mixed with organic fertilizers and vegetable pesticides so that there is no significant change because organic fertilizers contain organic material which is a food source for arthropods in addition to the dose of chemical pesticides used below the recommended dose. Before being sprayed semi-organic (1) compared with conventional farming systems before spraying, there was an average decrease of 2,250, and the difference in reduction was significant because of a significant value of $0,000 < 0.05$. Semi-organic before spraying (1) was compared with conventional farming systems after spraying 3,450, and the difference in reduction was significant because of a significant value of $0,000 < 0.05$. Semi-organic after spraying (2) compared to conventional before spraying showed an average decrease of 1,650, and the difference in reduction was significant because of a significant value of $0,001 < 0.05$. Semi-organic after spraying (2) compared to conventional after spraying showed an average decrease of 2,850, and the difference in reduction was significant because of a significant value of $0,000 < 0.05$. Conventional before spraying (3) compared to conventional after spraying showed an average reduction of 1,200, and the difference in reduction was significant because of a significant value of $0.026 < 0.05$. The diversity between the two locations is very different. This is caused by a comparison between the number of certain species with the total number of species found in a particular community. Arthropods found in the two locations showed different results in semi-organic fields before being sprayed with pesticides found 10 order and 21 families. Semi organic land after being sprayed with pesticides found 10 order and 19 families. Then in conventional land before spraying found 9 order and 18 families. The last, conventional land after spraying found 9 order and 17 families. The total of all individuals found in semi-organic and conventional fields was 2023 individuals. The individual most commonly found in the 4 types of sampling is formicidae. Natural enemies of insects are divided into two, namely parasitoids and predators. Ants including natural insect insects that act as predators. Ants are insects belonging to the order Hymenoptera and families Formicidae which have an abundant number of species and populations [3]. Ants are included in predatory insects because they are active and strong and prey on smaller, weaker insects.

The role of ants in nature can have positive and negative effects on animals and humans. Positive benefits cannot be directly enjoyed by humans such as the role of predators, decomposing organic matter, controlling pests, and even helping pollination [12]. Ants can be used as predators for pest control on plantations. *Solenopsis* sp. in Brazil it can be used as an agent for controlling the density of larvae of the *Diatrasa saccharalis*, a sugar cane borer [14]. The abundance of formicidae tends to be abundant in semi-organic land compared to conventional, this is because conventional land uses synthetic pesticides which cause death and displacement of soil arthropods in conventional rice fields. The high diversity shows the availability of good food energy sources. The existence of elements and organic matter is one factor, the low level of ants in conventional land. Organic material will be used by soil animals as an energy source. The high and low wealth of land arthropods is influenced by the presence of food and climate [4]. Stable climate conditions cause the wealth of insect species to be high.

Interview results show semi-organic chili farmers using chemical pesticides mixed with vegetable pesticides and organic fertilizers. Chemical pesticides used are active ingredients of imidacropid, permectrin, supermectrin, and mankeb, with an average dose of 75 cc: 200L. the spraying of semi-organic spills is done once every 7 days. Conventional chili farmers use synthetic pesticides with high doses above the recommended dose. The active ingredients of pesticides used by conventional chili farmers are dursban, chlorpirifos, methamidopos, dimethoate and malation usually at a dose of 1 ml: 200 L. The average spraying of conventional land is 5-6 days. Most farmers do not understand the role of land animals so they are less concerned about the environment and the

ecosystem of rice fields. The low diversity of conventional land is caused by the killing of soil nutrients by chemical pesticides. The continuous use of chemical pesticides will cause more serious problems, namely the killing of natural enemies, the occurrence of resistance, secondary pest outbreaks and environmental pollution [11].

IV. CONCLUSION

1. Semi-organic land before spraying has the highest diversity value with an average of 3.44, an average evenness value of 0.80, average taxa richness value of 20.2, and the lowest dominance index is 0.13. While the lowest is conventional land after spraying with an average diversity value of 2.10, an evenness index of 0.57, taxa wealth value of 12.7, and the highest dominance index value is an average of 0.25.
2. Semi-organic before spraying is compared with semi-organic after spraying with an average decrease in arthropod abundance of 0.600, and the difference in decrease is not significant because the significant value is $1000 > 0.05$. While other comparisons were significant, namely semi-organic before spraying compared with conventional farming systems before spraying a significant value of $0,000 < 0.05$ was significantly different. Semi-organic before spraying compared to conventional farming systems after spraying a significant value of $0,000 < 0.05$ was significantly different. Semi-organic after spraying compared to conventional before spraying showed a significant value of $0.001 < 0.05$ significantly different. Semi-organic after spraying compared to conventional after spraying showed a significant value of $0,000 < 0.05$ significantly different. Conventional before spraying compared to conventional after spraying showed a significant value of $0.026 < 0.05$ significantly different. This shows that the use of chemical pesticides can reduce the value of arthropod diversity.
3. Types and frequency of pesticide use in *Capsicum annum* L. chili on semi-organic farming system farmers using pesticides, organic fertilizers and imidacloprid chemical pesticides Imidacropid, permectrin, supermectrin and mankoseb, with an average frequency of watering pesticides once every 7 days. In chili farmers, conventional farming systems that use synthetic pesticides only are active ingredients of mextomil, mankozeb, dimethoate, profenofos, chlorpirifos and dursban. With a frequency of spraying as much as 5-6 days. Pesticides have been shown to reduce the diversity of soil arthropods, so they need to be considered for their use, and adjustments are recommended on the packaging label.

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The Improving Academic Performance Through Effective Managing Psychological Capital: With Reference To Undergraduates Of Rajarata University Of Sri Lanka

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Abstract: Psychological capital has been receiving increasing attention of global academia as it is deemed as an important controller of human performance. In business management it has extensively been explored, however no significant attention has been received to sightsee how the concept could be effectively used to swell academic performance of students. The purpose of this paper is to examine the impact of psychological capital on academic performance of undergraduates of Rajarata University of Sri Lanka. The data were collected from a sample of 300 students in all faculties of Rajarata University of Sri Lanka using the stratified sampling method through a self-administrated questionnaire. The questions were measured through Likert Five Scale. Results were drawn using bivariate correlation and linear regression analyses. Results of the study revealed that optimism, resilience, self-efficacy have positive significant impact on academic performance of the undergraduates of Rajarata University of Sri Lanka, albeit the impact of hope on academic performance was negative and statistically insignificant. The research provides important information about the impact of increasing psychological capital on academic performance of undergraduates. Although the impact of psychological capital on performance has been investigated in the other contexts, research in Sri Lankan context is scant. Therefore, this study provides insights particularly to the present context might be also valid in Sri Lankan University Context. Conclusions from this research suggested that, in order to increase the academic performance of students is essential to enhance the resilience, optimism, self-efficacy of the students. The resilience of the students could be increased by educating them to handle stressful situation effectively. Series of positive thinking workshop would be more effective to change the mindset of undergraduates, by then optimism could be reached up to expected level. Self-efficacy could be achieved redesigning university curricula incorporating more practical sides of the subjects to uplift students' extra-curricular activities, group activities.

Keywords - psychological capital, academic performance

INTRODUCTION

Education is considered as a basic human need as it connects with well-being and development of society. The social and economic development of a nation is directly relate with education quality and superiority of academic activities (Mushtaq & Khan, 2012). Academic performance refers to how students deal and cope with the different tasks associated with their studies, the ability to study and remember facts and being able to communicate one's knowledge in verbal or written form (Thamavithya, 2011), is influenced by number of social, psychological, economic, environmental and personal factors (Mushtaq & Khan, 2012). The academic performance and learning of university students, are proposed to the influence individual's career success and employability (Fugate, Kinicki, & Ashforth, 2004). Among aforementioned determinant of academic success, psychological capital has not been reached to its maximum in behavioral research process, so substantial further exploration is imperative for the field (Mushtaq & Khan, 2012). Psychological capital means a positive assessment of circumstances and probability of success due to

motivated effort and perseverance (Luthans, Avolio, Avey, & Norman, 2007). The concept of psychological capital helps to understand the behavior of human being (Schaufeli & Bakker, 2004), and it can only be developed by self-practice (Seligman, 2002).

Psychological capital is interest and emerging concept in present era. In reviewing the literature, it was noted that psychological capital has been increasingly tested in different context. Ample studies had been done in organizational levels to test the impact of psychological capital on business performance (Luthans, Avolio, Avey, & Norman, 2007a; Avey, Nimnicht, & Pig, 2010). Further, Kappagoda, Othman, & De Alwis (2014) examined the psychological capital and its impact on Job Performance in the Banking Sector employees in Sri Lanka. Moreover, Abbas & Raja (2014) investigated psychological capital on innovative performance. However, no ample studied were evident in university/ higher educational context to test academic performance and psychological capital, demonstrates the need and essentiality of excavating latent association of psychological capital has on student performance. Accordingly, researchers interested to investigate how does psychological capital impact on academic performance of undergraduates in Sri Lanka?

LITERATURE REVIEW

Academic performance refers to how students handle their studies and how they cope with various tasks (Banquill, et al., 2009) and plays a significant role in creating the best quality graduates for the country's social and economic development (Ali, et al., 2009). The Grade Point Average (GPA) is now used by most of tertiary institution as a convenient summary measure of academic performance (Mushtaq & Khan, 2012; Singh, Malik, & Singh, 2016). Further, Cumulative Grade Point Average (CGPA) was also used by higher education institutes to evaluate academic performance of students (Muhammad, Tahir, Muhammad, & Ali, 2011). Continuous Assessments and End Semester Examination are major contributors for the GPA and is measured proportionally on given weight. Continuous assessments consist of tutorials, reports, presentations, field visits, projects and classroom tests. Assessment criteria for practical-oriented subjects and languages were determined considering expected characteristics of graduates (Undergraduates Prospectus, 2019). The academic performance is determinant by various factors such as technology, family background, psychological capital, physical strength, skills and attitudes (Mushtaq & Khan, 2012). Psychological capital is the positive side of human life and psychological state for development, is defined as hope, optimism, self-efficacy, resilience, creativity, courage and wisdom of a human. It is characterized by efficacy: having confidence to take on and put in necessary effort to succeed at challenging tasks, optimism: making a positive attribution about succeeding now and in the future, hope: persevering towards goals when necessary and redirecting paths to goals in order to succeed, resilience: ability to sustaining and bouncing back and even beyond to attain success (Luthans, Avolio, Avey, & Norman, 2007a). Psychological capital is beyond human and social capital (Sridevi & Srinivasan, 2012). Economic capital focuses on "what you have?" human capital on "what you know?" and social capital on "whom you know?" psychological capital focuses on "Who you are?" and what you can become? (Luthans, Avolio, Avey, & Norman, 2007). It is unique and open to measurement, development and performance improvement in the work place (Luthans, Youssef, & Avolio, 2007b). Hope, optimism, self-efficacy and resilience are four major pillars of psychological capital (Luthans, Avolio, Avey, & Norman, 2007).

Hope is a positive motivational state that is based on an interactively derived sense of successful (a) agency: goal directed energy, (b) pathways: planning to meet goals (Snyder, 2012; Luthans, Avolio, Avey, & Norman, 2007a). It is the ability to formulate plans and strategies to persevere to achieve goals. Hope has a willpower to act creatively and an ability to explore different ways to accomplish the goals (Luthans, Avolio, Avey, & Norman, 2007). Hopeful employees tend to be creative and resourceful, even with tight budgets (Luthans, Youssef, & Avolio, 2007b). Resilience is positive psychological capacity to 'bounce back' from adversity, uncertainty, conflict, failure, or even positive change, progress and increased responsibility (Luthans, 2002a). It is the ability to handle situations under certain tasks and unfavorable conditions (Masten & Reed, 2002). Resilient believes that having what it takes to be successful provides the necessary staying power in the face of repeated failures, setbacks and skeptical or even critical social responses that are inherently daunting (Bandura & Locke, 2003). Resilience helps people become flexible and adaptable even in highly changing and unsafe situations (Coutu, 2002). Optimism is the mood or attitude associated with an interpretation about the social or material – one which the evaluator regards as socially desirable to his/her advantage, or for his/her pleasure" (Schneider, 2001). Optimism refers to a positive attribution or expectation of success in the present time as well as in the future, a thought and an expectation that the future will be good (Snyder, 2002). In this context, the optimists are people who have positive attitudes about being successful in the present and in the future, (Peterson, Luthans, Avolio, Walumbwa, & Zhang, 2011). Optimism is an attribution style that explains positive events in the form of personal, permanent and pervasive causes and negative events in relation to external, temporary and situations-specific events (Seligman, 1998). Self-efficacy is conviction or confidence of once having to mobilize cognitive resources, to take necessary actions to perform a particular task successfully overcoming problems (Stajkovic & Luthans, 1998b). It is an ability to organize and execute the actions needed to

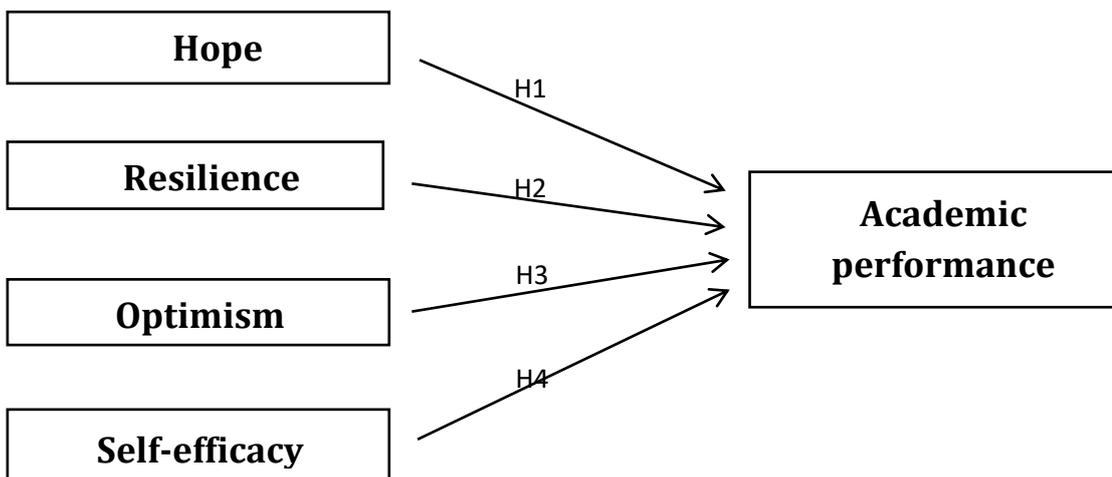
produce certain accomplishments" (Bandura, 1997). Therefore, this self-belief influences how people behave and make decisions, and how much effort they spend on the task (van Dinther, Dochy, & Segers, 2011). Self-efficacy promotes and encourages academic achievement through increasing academic aspiration both directly and indirectly (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996).

Sweetman, Luthans, Avey, & Luthans (2010) found a strong relationship between creative performance and psychological capital (hope, self-efficacy, resilience, and optimism) (Peterson & Byron, 2007). Lee (2009) examined the relationship between resilience and academic achievement of students in Georgia through 91 senior students. The study showed that resilient had a positive relationship with academic performance of students. Medlin and Faulk (2000) investigated that relationship between student engagement and optimism and the impact of on individual academic performance of United States university students through 145 students. Result indicated that student engagement was positively correlated with optimism and performance, while optimism is positively correlated with performance. (Motlagh, Amrai, Yazdani, Abderahim, & Sourie (2011) investigated the relationship between self-efficacy and academic achievement in high schools students. Here, 250 students were selected on cluster sampling method and result delineated that sub factors of self-efficacy: self-evaluation and self-regulation are the best predictors of academic achievement.

METHODOLOGY

The study was explanatory type study and it applied quantitative research approach and questionnaire survey strategy. The target population were all undergraduates of Rajarata University of Sri Lanka (approximately 5500) from which 300 students were selected on stratified sampling method to have a proper mix of students from all faculties, as the sample of the study. As unit of analysis was in individual students, study developed a questionnaire to collect required data. The questionnaire contains thirty eight questions under three sections that section I is opened for demographic information of respondents and section II and III is used to measure independent and the dependent variables through 5 point Likert Scale. Two senior academics at the Management faculty reviewed and debugged the questionnaire appropriately. Data were collected by researchers themselves visiting the faculties that lead for higher response rate and speedy data collection. SPSS software assisted for data analysis and descriptive statistics, correlation and regression tests were employed on the data for robust conclusion.

Figure: Conceptual Framework



Source: Developed by Researcher

The framework showed the relationship between the psychological capital and academic performance of undergraduates. In this model hope, resilience, optimism, self-efficacy considered as independent variables and academic performance was the dependent variable.

DATA ANALYSIS AND DISCUSSION

Study collected data from undergraduates of Rajarata University from January 2019 to March 2019 period and distributed 300 questionnaires among six faculty students. Response rate was 93%. That was accurate enough to derive strong conclusion. The reliability of the questionnaire was tested through Cronbach Alpha value and it

exceeded the threshold value (0.7) by each variable evidenced the internal consistency of items being considered for the study.

1.1 Reliability Analysis

4.1Table: Reliability Analysis

Variable	No of items	Alpha value	Comment
Hope	06	0.734	Acceptable
Resilience	06	0.711	Acceptable
Optimism	06	0.693	Acceptable
Self-efficacy	06	0.708	Acceptable
Academic performance	10	0.757	Acceptable

Source: Survey Data, 2019

1.2 Sample profile

4.2Table: Sampling Profile

Demographic Factor	Items	Percentage
Faculty	Management Studies	28.67%
	Social Sciences & Humanities	26%
	Medicine & Allied Science	16.66%
	Applied Science	9.33%
	Agriculture	8.67%
	Technology	8.67%
Academic Year	02 nd year	35.34%
	03 rd year	32%
	04 th year	32.66%
Gender	Male	50.66%
	Female	49.34%

Source: Survey Data, 2019

The questionnaire has been distributed among six faculty students fairly equal. Maximum response rate was recorded by Management faculty and minimum was from Technology. Male response rate for the study was 50.66% and it was significantly higher than female response rate.

1.3 Descriptive statistics

According to the descriptive statistics, overall mean value of academic performance, was 3.9147. It implies that student record higher level of academic performance through semester examinations. Mean value of self-efficacy and resilience were 3.7956, 3.6733 respectively. It indicated that students have ability to organize and execute the actions needed to produce certain accomplishments of his/her life; have capacity to bounce back from adversity, uncertainty, conflict, failure. The positive attribution / expectation of success in the present time as well as in the future of students were at moderate level reporting 3.005 mean value for the "Optimism" variable. However, hope shown significantly lower mean value comparatively to other variables in the study. It was 2.279 and indicated that lower level of positive motivational state of student.

The exploration of descriptive statistics further indicated that students of Agriculture faculty shown significantly higher level of academic performance than the other faculties. However, no evidence found to delineate the significant differences of academic performance among other faculties. Moreover, ANOVA test indicated that academic performance of students does not depends on year of the study in the university.

1.4 Correlation Analysis

4.3Table: Correlation Analysis

Variable	Academic Performance	Hope	Resilience	Optimism
Academic Performance	1			
Hope	-0.319**	1		

Resilience	0.421**	-0.389	1	
Optimism	0.316**	-0.078	0.150	1
Self-efficacy	0.434**	-0.484	0.437*	0.146

** correlation is significant at the 0.01 level (2-tailed)

* correlation is significant at the 0.05 level (2-tailed)

Source: Survey Data, 2019

To test the association between independent variables and the dependent variable, study applied correlation analysis, as per the correlation test, correlation coefficient of resilience, optimism and self-efficacy were positive and statistically significant at 0.05 level. Accordingly it could be concluded that resilience, optimism and self-efficacy had statically significant association with academic performance of students. However, interestingly, Hope has recorded a negative association with academic performance of students and it too was statistically significant.

1.5 Regression Analysis

4.4Table: Regression Analysis

R Square: 0.313		ANOVA:0.000	
Variables	Unstandardized Coefficients (B)	Standardized Coefficients(Beta)	Sig.
(Constant)	2.007		0.000
Hope	-0.068	-.084	0.301
Resilience	0.206	.243	0.002
Optimism	0.176	.236	0.003
Self-efficacy	0.205	.252	0.002

Source: Survey Data, 2019

The impact of hope, resilience, optimism and self-efficacy on the student academic performance was measured through multiple regression analysis. Coefficient of determination (R square value) of the fitted regression line was 0.313. Accordingly, 31% variation of dependent variable is able to be explained through independent variables. Significance value of ANOVA table was less than 0.05, indicated that model is strong enough to explain the impact of independent variables having on the dependent variable. Hence, the model will be strongly enough to predict the future changes of academic performance of students.

According to regression result, it was found that hope had statistically insignificant negative impact on academic performance of undergraduates. The findings of the study were somewhat contradictory with many previous studies where Amules, Yoon and Amudson (2015) found a moderate positive relationship between hope and academic performance.

Resilience of students had statistically positive significant impact on student performance conforming the findings of Mwangi, Okatcha, Kinai, & Ireri (2015) found that significant positive relationship between resilience and academic achievement. Resilience of undergraduate was highly positive in the current study as they could usually succeed to form positive impression about the others and student could handle many academic activities effectively with other extra-curricular activities. Furthermore, students could usually overcome stressful work situations restoring normal mood quickly after the unpleasant events.

Medling & Fault (2006) found that significant and positive relationship between optimism and student performance. It was further reconfirmed by the present study showing statistically significant impact of optimism on academic performance. Optimism of undergraduate demonstrates that they always look on the bright side of their academic activities and students expect pleasant events rather than the unpleasant events of the university life. And also students always optimistic about their future.

The impact of self-efficacy on academic performance of students was statistically significant. Further explorations of self-efficacy demonstrate that students have confidence to analyze problem they face and find sustainable solutions. The decision aligned with the finding of Motlagh, Amrai, Yazdani, Abderahim, & Sourie (2011) that positive impact of self-efficacy on academic achievement in High School Students. Standardize beta coefficient of the regression line

evidenced that self-efficacy of undergraduates is highly impact to the academic performance than the optimism, hope and resiliency.

CONCLUSION AND RECOMMENDATION

The study focused to measure impact of psychological capital on academic performance of students at Rajarata University. Psychological capital was measured through hope, resilience, optimism and self-efficacy. As per the regression test, except hope, all other variables shown statistically significant positive impact on academic performance among them self-efficacy was stronger determinant of academic performance. Accordingly, it could be recommended to swell students' resilience, optimism and self-efficacy to uplift academic performance of students. Resilience of students could be augmented through training students to make a proper plan to manage routings and contingences effectively. Further, students should be directed to acquire life-long experience, knowledge and skills through extra-curricular activities during the university life. Moreover, student could be taught to look good sides of everything. Furthermore, a broader awareness should be given to students, how to cope more stressful work situations effectively. Optimism of students could be enriched giving chance students to engage in extra-curricular activities during the study period. Furthermore, students should be taught how you could manage well your stress level and how to meet unexpected situations. Thus, proper mind set should be develop through series of workshops or organized student activities.

Further found that undergraduates self-efficacy positively influence to the academic performance. Self-efficacy could be enhanced through the creation of self-confidence to express ideas without any fear. Students should be given a chance to present more ideas, and opportunity should be given to students express their views, ideas and the debate. Further, they could be educated more about how to analyze their problems in different point of view and get better decisions for those problems.

Following suggestions are important for future research. This study has taken psychological capital as independent variable and there can be considered more factors in future researches to further investigation of undergraduates' academic performance. This study was focused on only Rajarata University of Sri Lanka. Therefore it has made difficulties on generalizing the findings to the entire population. There were difficulties in covering all the areas in Sri Lanka. Because lack of resources such as time and financial it was difficult to conduct this study in correct manner. Therefore, suggest that future studies carried out considering other universities of Sri Lanka.

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Improving Students Writing Skill Using English Movie With Subtitle

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Abstract- This research is about improving the students' writing skills using English movies with subtitles. In this research, the movie used is short movies applying the narrative text to make the teaching-learning process effective. This research applied a Classroom Action Research. The research was carried out in two cycles. The steps were namely planning, implementing, observing, and reflecting. The data of the research were completed by using quantitative and qualitative data. The research finding showed that after using the English movie subtitle, the students' writing skill achievement improved.

Index Terms- English Movie, Subtitle, Writing Skill, Students

I. INTRODUCTION

According to Saken "Language is a system of some sort with one distinct function for human beings, namely to serve as a vehicle of communication in social interaction" [1]. Language can become a bridge to connect with each other, even in the same place or in different places. According to Wardhaugh "Language is what the members of particular society speak" [2]. The important thing in the language is how people communicate using spoken or written the language to get information from other people.

According to Harmer "Writing (as one of the four skills of listening, speaking reading and writing) has always formed part of the syllabus in the teaching of English. However, it can be used for a variety of purposes, ranging from being merely a backup for grammar teaching to a major syllabus stand in its own right, where mastering the ability to write effectively is seen as a key objective for learners" [3].

Writing is one of the difficult skills; it will be interesting if the teacher using media in teaching. Teachers have to make teaching writing easier and fun. Teachers need to provide for effective writing instruction [4]. The media are usually defined as a list, a curriculum statement; the media include television, film, video, radio, photography, music, printed material, books, comics, magazines, and the press, and computer software [5]. Choosing an interesting media or technique in the class of writing is one of the alternative ways that the teacher has to do.

According to Williams "Writing is one of the principal modes of communication in any health organization. It is used to convey information both within the health team and from the team to clients, other professionals, and organizations, hence the vast array of documents generated on a daily basis by health workers [6]. Process writing in the classroom activity has four main elements: planning, drafting, editing (reflecting and revising), and final version [3].

In this research, the researcher used short cartoon movies. They were used as media so the duration of the movies had to be considered. To avoid the students' difficulties in understanding the movies, they were added by subtitles. Referring to the background of the study, the objectives of this research were 1) to know how to improve students writing skills by using English Movie Subtitle; 2) to know how student's writing skill achievement by using English movies subtitle.

II. LITERATURE REVIEW

A. Definition of writing

Writing is the string words, sentence, and paragraph to pass a message in the form of information, idea, or thinking. According to Richard "writing is the most difficult skill for learners to master. The difficulty lies not only in generating and organizing ideas but also in translating these ideas into readable text [7].

According to Gelb "Writing is clearly a system of human intercommunication by means of conventional visible marks, but it is evident from what has been said that what the primitives understood as writing is not the same thing as what we do" [8]. Hyland stated that learning to write in a foreign or second language mainly involves linguistic knowledge and vocabulary choices, syntactic patterns, and cohesive devices that comprise the essential building blocks of texts [4].

According to White and Arndt “Through writing, we are able to share ideas, arouse feelings, persuade and convince other people. We are able to discover and articulate ideas in ways that only writing makes possible” [9]. And also writing is a form of problem solving which involves such processes as generating ideas, discovering a voice with which to write, planning, goal setting, monitoring and evaluating what is going to be written as well as what has been written, and searching for language with which to express exact meaning [9].

B. Micro and Macro skills of Writing

The micro skill of writing Produces graphemes and orthographic patterns of English. Produce writing at an efficient rate of speed to suit the purpose. Produce an acceptable core of words and use appropriate word order patterns. Use acceptable grammatical systems (e.g. tense, agreement, pluralization), patterns, and rules. Express a particular meaning in different grammatical forms. Use cohesive in written discourse. Macro-skill of writing. Use the rhetorical forms and conventions of written discourse. Appropriately accomplish the communicative functions of written texts according to form and purpose. Convey links and connections between events, and communicate such relations as the main idea, supporting the idea, new information, given information, generalization, and exemplification. Distinguish between literal and implied meanings when writing. Correctly convey culturally specific references in the context of the written text. Develop and use a battery of writing strategies, such as accurately assessing the audience’s interpretation, using prewriting devices, writing with fluency in the first drafts, using paraphrases and synonyms, soliciting peer and instructor feedback, and using feedback for revising and editing [10].

C. Aspects of writing

According to Hughes, There are five important aspects to be assessed in writing. They are content, organization, vocabulary, grammar, and mechanics [11]. Content is the ability to use the knowledge and understandable subject and information, development thesis, interrelationship of many details relevance of materials and topic. According to Heaton “content is the ability to think creatively and develop thoughts, excluding all irrelevant information” [12].

The writing must consist of an introduction, body, and conclusion. Appropriate title, effective introductory paragraph, the topic is stated, leads to the body, transitional expressions used; the arrangement of material shows plan; supporting evidence given for generalizations; conclusion logical and complete [13]. Vocabulary is a core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write. Without an extensive vocabulary and strategies for acquiring new vocabulary, learners often achieve less than their potential and maybe discouraged from making use of language learning opportunities around them such as listening to the radio, listening to native speakers, using the language in different contexts, reading, or watching television [7].

Grammar is partly the study of what forms or structures are possible in a language. Traditionally, grammar has been concerned almost exclusively with analysis at the level of the sentence. Thus a grammar is a description of the rules that govern how a language’s sentences are formed [14]. Writing has its mechanical components. These include handwriting, spelling, punctuation, and the construction of well-formed sentences, paragraphs, and text. Such things are the nuts and bolts of the writing skill and they need to be focused on at certain stages of learning to write in English [3].

D. Process of Writing

Writing is a difficult activity for many people, especially for students. According to Langan, There are four steps in the writing process. The following are [15]: a) Pre-writing, There are five pre-writing Technique that will help you think about and develop a topic and get words on paper: 1) Free writing Technique, 2) Questioning Technique, 3) Making a List Technique, 4) Clustering Technique, 5) Preparing a scratch outline Technique. b) Drafting is formal writing begins. Students can use their prewriting materials as a guide to starting the writing. During the drafting stage, students should concentrate on getting their ideas on paper organizing their information logically, and developing their topic with enough details. c) Revising is as much a stage in the writing process as prewriting, outlining and doing the first draft. Revising means rewriting a paper, building on what has already been done, in order to make it stronger. d) Editing is focused on correct errors in grammar, punctuation, and spelling. Students often difficult to edit a paper carefully, so editing can come from a teacher, classmate, computer, etc.

E. Narrative text

The narrative text is a text which tells a story [16]: Narrative writing is a type of writing in which the writer as the character narrates the story [17]. Novels, short stories, novellas, poetry, biographies can all fall in the narrative writing style. Simply, narrative writing is an art to describe a story. According to Pardiyo “Narrative text tell a life story, this life story can be just fiction or can also be a true story Narrative text fictionalized can also be found in movies or TV shows. There are four main structures in narrative text namely; Orientation, Complication, Resolution, Coda. In the narrative text, there are six characteristics or language features of narrative text, those are Past tense, Adverb of time, Time conjunction, Specific character not general, Action verb, Direct speech [18].

F. Media in teaching writing

Media is a means of communication and a source of information. The term refers to anything that carries information between a source and a receiver. Examples include video, television, diagrams, printed materials, computer programs, and instruction. The purpose of media is to facilitate communication and learning. There are six media that can be used in teaching and learning activity. Those are [19]: Visual, Text, Audio, Motion media, Manipulative, People. Iris explained that the advantages of using visual media to

students in teaching and learning are as follows [20]: 1) By using visual media student will catch the illustrations which must be based on the past experience of the viewer. 2) The picture of the movie is simple and presents not only one idea. 3) The picture should be realistic and in keeping with the cultural beliefs. 4) Visual media is most easily understood. 5) A picture showing only part of an object or person may not be understood, or even be seen as ugly.

G. English Movie with Subtitle

According to Jalinus Movie is a light-sensitive material in the shooting function to place the image recording. The movie is a media that is very large in its ability to assist the teaching and learning process. English movie is difficult to understand what else for students. Understanding is an important element in the teaching-learning process. To make easier in understanding the content of the movie it can be used as a subtitle. The subtitle is a printed statement or fragment of dialogue appearing on the screen between the scenes of a silent motion picture or appearing as a translation at the bottom of the screen during the scenes of a motion picture or television show in a foreign language. Hossein Sabouri, Mohammad Zohrabi in their research concluded that the use of movies with subtitles can improve students' engagement in learning and retrieval of new lexical items. However, more studies need to be done in the future in order to get the most advantages out of the movie materials in EFL classrooms [21].

H. Advantages of Movie in Teaching Writing

According to Harmer, there are four advantage movies in teaching writing, those are [22]: One of the main advantages of the movie is that students do not just hear the language, they see it too. This greatly aids comprehension, since, for example, general meaning and moods are often conveyed through expression, gesture, and other visual clues. Thus we can observe how intonation can match facial expression. All such, paralinguistic features give valuable meaning clues and help viewers to see beyond what they are listening to, and thus interpret the text more deeply. Movie uniquely allows students to look at situations far beyond their classrooms. This is especially useful if they want to see, for example, typical British 'body language' when inviting someone out, or how Americans speak to waiters. The film is also of great value in giving students a chance to see such things as what kinds of food people eat in other countries, and what they wear.

When students use a movie as their own as media in the teaching and learning process, they are given the potential to create something memorable and enjoyable. The camera operators and directors suddenly have considerable power. The task of filmmaking can provoke genuine creative and communicative uses of the language, with students finding themselves 'doing new things in English'. For all the reasons so far mentioned, most students show an increased level of interest when they have a chance to see language in use as well as hear it, and when this is coupled with interesting tasks.

III. RESEARCH METHOD

A. Research Design and Procedure

The research design used in this research was classroom action research. According to Arikunto "Classroom Action Research is not only testing a treatment but first research already has confidence will be something of treatment. Thus the research of this action can be seen as a follow-up to both descriptive and experimental" [23]. Classroom action research is research that intends to improve learning in the classroom and to improve the ability of students. This research also helps the teacher to solve the problems in the classroom. In this research, the researcher collaborated with the English teacher the collaboration was focused on the preparation, implementation, observation, and reflection. The cycles of classroom action research consist of planning, implementing, observing, and reflecting.

B. Population and Sample

The subject of this research was the second grade in MA Darullughah Wal Karomah in the 2019/2020 academic year. The researcher only conducted research in one class (XI IPA) which contains 25 students. The researcher had conducted the research on the second grade in MA Darullughah Wal Karomah. Which is located at Flamboyan, Sidomukti, Kraksaan, Probolinggo, East Java.

C. Data Collecting Technique

Observation; The researchers observed and took an observation from the students when they were doing the teaching-learning process. So the researcher took the data from the observation checklist. Interview; In this interview, the researcher collaborated with the English teacher in order to get information about the student's needs. The researcher also interviewed the students after they had been given the treatment. Test; In this research, the researcher applied the writing ability test because the researcher wanted to know and measured the student's writing skills after they had watched the English movie subtitle, the writing test was constructed by the researcher based on the basic competencies of curriculum.

Table 1. Scoring Rubric on Writing

Aspect	Level	Criteria
Content	30-27	Excellent To Very Good: knowledgeable; substantive; thorough development of thesis; relevant to the assigned topic.
	26-22	Good To Average: some knowledge of the subject; adequate range; limited development of thesis; most relevant to the topic but lacks detail.
	21-17	Fair To Poor: limited knowledge of the subject; little substance; inadequate development of the topic.
	16-13	Very Poor: does not show knowledge of the subject; non-substantive; not pertinent; OR not enough to evaluate.
Organization	20-18	Excellent To Very Good: fluent expression; ideas clearly stated/supported; succinct; well-organized; logical sequencing; cohesive.
	17-14	Good To Average: somewhat choppy; loosely organized but main ideas stand out; limited support; logical but incomplete sequencing.
	13-10	Fair To Poor: non-fluent; ideas confused or disconnected; lacks logical sequencing and development.
	9-7	Very Poor: does not communicate; no organization; OR not enough to evaluate.
Vocabulary	20-18	Excellent To Very Good: sophisticated range; effective word/idiom choice and usage; word form mastery; appropriate register.
	17-14	Good To Average: adequate range; occasional errors of word/idiom form; choice, usage but meaning not obscured.
	13-10	Fair to poor: limited range; frequent errors of word/idiom form; choice, usage; meaning confused or obscured.
	9-7	Very Poor: essentially translation; little knowledge of English vocabulary, idioms, word form; OR not enough to evaluate.
Grammar	25-22	Excellent To Very Good: effective complex construction, few errors of agreement, tense, number, word order/function, articles, pronouns, prepositions.
	21-18	Good To Average: effective but simple constructions, minor problems, in complex constructions, several errors of agreement, tense, number, word/function, articles, pronouns, prepositions but meaning seldom obscured
	17-11	Fair To Poor: major problems in simple/complex construction, frequent errors of negation, agreement, tense, number, word order/function, articles, pronoun, preposition and/or fragments, run-on, deletions, meaning confused or obscured.
	10-5	Very Poor: virtually no mastery of sentence construction rules, dominated by errors, does not communicate, OR not enough to evaluate.
Mechanic	5	Excellent To Very Good: demonstrates mastery of conventions; few errors of spelling, punctuation, capitalization, paragraphing.
	4	Good To Average: occasional errors of spelling, punctuation, capitalization, paragraphing but meaning not obscured.
	3	Fair To Poor: frequent errors of spelling, punctuation, capitalization, paragraphing, poor handwriting, meaning confused or obscured.
	2	Very Poor: no mastery of conventions; dominated by errors of spelling, punctuation, capitalization, paragraphing, handwriting illegible, OR not enough to evaluate.

Source: Arthur Hughes

D. Data Analysis Technique

In the technique of data analysis, the researcher obtained qualitative data through observation by using systematic observation. Then the result of systematic observation was analyzed by using the formula as follows:

$$p = \frac{S}{N} \times 100\%$$

To know the average student's high score (mean), the researcher collected the result of the test using the formula as follows:

$$M = \frac{\sum x}{N}$$

The standard minimum score (KKM) of English lesson for second grade in MA Darullughah Wal Karomah was 75. So that researcher tried to get the class percentage which passes the standard minimum score by using the following formula:

$$P = F/N \times 100$$

The formula had been used in pre-cycle, in the first cycle and the second cycle. The mean score from the pre-cycle was compared with the mean of the first and the second cycle. It was done to know the average of students' scores and to know how far the improvement of students writing skills. The formula was:

$$P = \frac{y_1 - y}{y} \times 100 \quad P = \frac{y_2 - y}{y} \times 100$$

This research is considered as a success if the objectives indicator were reached if: a) Student's average achievement in English is equal to or higher than 75 and b) The number of the students reach the minimum score (75) are equal to or higher than 75% of total students in the research. To know the validity of the test, the researcher used the estimation from the English teachers rate in MA Darullughah Wal Karomah. There were three English teachers in MA Darullughah Wal Karomah.

IV. RESULTS AND DISCUSSION

A. Results of Research

In this chapter, the researcher would like to discuss the research findings. This research was about classroom action research in improving students writing skills using English movie subtitles in second grade in MA Darullughah Wal Karomah. The research consisted of preliminary research, cycle one, and cycle two. The results are as follows:

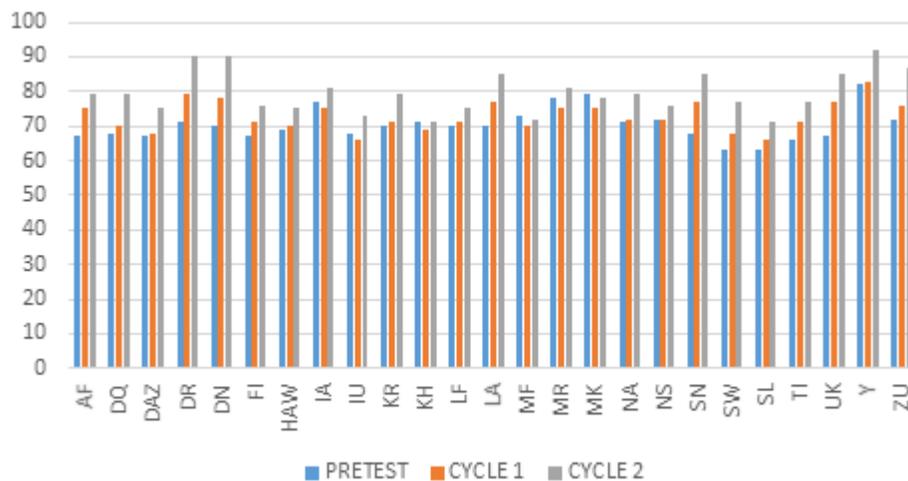


Figure 1. The result of the pre-test, cycle one, cycle two and post-test scores

The mean of students' scores in the pre-test was 70, 36 and the percentage of students who passed KKM is 16%. The mean of students score in cycle one was 72, 88 and the percentage of students who passed KKM 44%. The mean of students score in cycle two was 79, 52 and the percentage of students who passed KKM 88%.

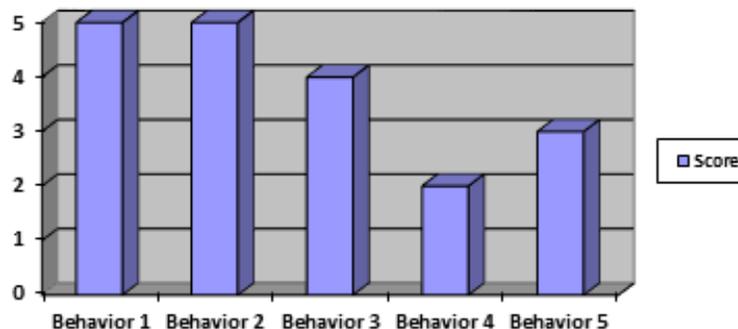


Figure 2. The students score of cycle one observation

Behavior 1 was about students pay attention to the teacher, in cycle one the students so good on pay attention to their teacher. Behavior 2 was about students focus on watching the movie, in cycle one students so good on focus on watching the movie. Behavior 3 was about students answer the teacher's question, in cycle one students good on answer the teacher's question. Behavior 4 was about students ask a question to clarify understanding, in cycle one there was one to two students ask a question to clarify understanding. Behavior 5 was about student's enthusiasm for doing the task, in cycle one student not much enthusiasm in doing the task. So from this observation in the cycle, one got a score of about 76%.

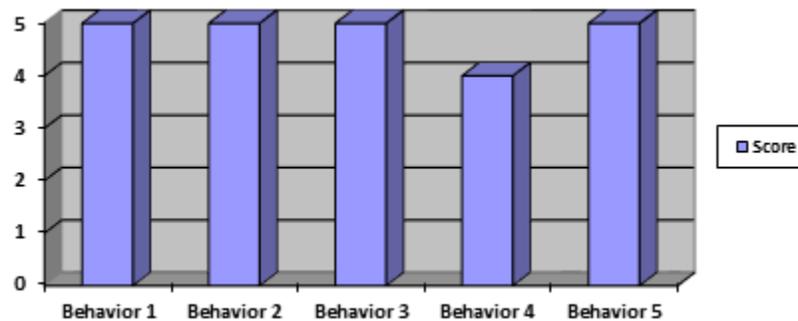


Figure 3. The students score of cycle two observation

Behavior 1 was about students pay attention to the teacher, in cycle one the students so good on pay attention to their teacher. Behavior 2 was about students focus on watching the movie, in cycle one, students so good on focus on watching the movie. Behavior 3 was about students answer the teacher's question, in cycle one students answer the teacher's question very well. Behavior 4 was about students ask a question to clarify understanding, in cycle one students ask a question to clarify understanding with good. Behavior 5 was about students' enthusiasm for doing the task, in cycle one student very enthusiastic about doing the task. So from this observation in the cycle, one got a score of about 96%.

B. Discussion

The researcher played the role of the teacher. She taught the teaching-learning process in the class. In the first meeting, the title of the movie was "Aladdin". The researcher explained the material, showed the movie, the movie was showed three times to the students. In the first show, students just focused on watching the movie. On the second show, the students watched and had to take a note about the movie. For the last show, the students had to watch and then correct their notes. After the students watch the movie the researcher told the students to answer the question, and then make a paragraph.

According to Smaldino, There are six media that can be used in teaching and learning activity. One of them is visual media such as movies [19]. In addition, Harmer stated that there are four advantages of the movie in teaching writing, those are seeing language in use, cross-culture awareness, the power of creation, and motivation [22]. After implementing the English movie subtitle, the researcher got the data from the preliminary research, cycle one, and cycle two. The result of the research shows that there was an improvement in students' writing skills.

In the pre-test, the average of students' scores was 70,36. Meanwhile, the percentage of students who passed the standard minimum score (KKM) was 4 students or 16% from 25 students. Thus, it means the students' writing skill was still low. In cycle one, the average of students' scores was 72,88. Meanwhile, the percentage of students who passed the standard minimum score (KKM) was 11 students or 44% from 25 students. Thus, it means in cycle one the students' writing skills still could not pass the standard minimum score (KKM). In this cycle, the students were given treatment by using the English movie with subtitles. Then, they had to answer the questions given to create a paragraph about the movie. In cycle two the average of students' score was 79,52. While the percentage of students who passed the standard minimum scores (KKM) was 22 students or 88% from 25 students. Thus, it means the students' writing skills improved and they could pass the standard minimum score. It can be concluded that the percentage of achievement of students' scores for cycle one was 3.5% and in cycle two 12.9%. Thus, it can be said their achievement improved from cycle one to cycle two.

V. CONCLUSION

After finishing the research, the researcher concluded that the English movie subtitle could improve the students' writing skills. The researcher implemented the English movie subtitle three times to the students. On the first show, the students just focused on watching the movie. On the second show, the students watched and had to take a note about the movie, and the last show, the students had to watch and corrected their notes after the students had watched the movie, the researcher told the students to answer the questions and wrote a paragraph based on their answer.

After using the English movie subtitle, the students' writing skills improved. It was proved by the result of the students' scores. The research findings show that the data improved cycle by cycle. The mean scores of the pre-test were 70.36, cycle one was 72.88 and cycle two was 79.52. The percentage for cycle one was 3.5% and cycle two was 12.9%. It can be concluded that using English movies with subtitles can improve students' writing skills.

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The Effect Of Experiential Marketing On Customer Satisfaction At CGV Cinema In Palembang

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Abstract- The purpose of this study was to determine and analyze the impact of experiential marketing on customer satisfaction at CGV Cinema in Palembang. The used data are primary data obtained from a survey of 150 customers CGV Cinema in the city of Palembang, which were selected randomly. This study used Multiple Linear Regression analysis technique and the results showed that experiential marketing has a positive and significant impact on customer satisfaction.

Index Terms- experiential marketing and customer satisfaction.

I. INTRODUCTION

In modern times the public interest regarding the higher business and is increasing every year. The increasing number of new businesses are popping up, then increasingly fierce business competition, especially for those businesses that have a similar category. Corporate leaders must always strive to be the company stay ahead and be able to continue to compete with a competitor business. In the face of competition, companies must have a competitive advantage in order to survive, one of the most important thing is to focus on the consumer. Focus on consumers could be done by providing experience or experience that is perceived by the consumer.

To influence the emotions of the consumers, the marketing concept that can be used either by the approach Experiential Marketing is an ability of providers of goods and services within product offering emotional experience to touch the hearts and minds of consumers (Schmitt, 2011). At this stage of experiential marketing, customer saw manufacturer as someone who has an emotional value that is a view that emphasizes the relationship between producers and customers to stage unforgettable experiences receipt by the customer, because the customer is the center of all marketing efforts.

Schmitt (2011) explains that in order to create a unique experience to the consumer, there are two aspects that constitute

the framework of marketing experiential namely Strategic Experiential Modules (SEMS), which became a sponsor for the marketing experiential and Experience Providers (Ex Pros) who became a tactical tool in marketing experiential. Through these two, a customer experience that can not be forgotten (memorable experience) can be created. The steps in creating that experience is through Sense Marketing, Marketing Feel, Think Marketing, Marketing Act, and Relate Marketing which will be formed on each consumer to make them satisfied with a particular brand.

The increasing purchase power of Indonesian society and the public's demand for entertainment or recreational (leisure) is now growing optimism in the business sector in Indonesia, one of them is cinema business. These business players are not only located in major cities in Java only, but has penetrated all the major cities in Indonesia, such as Palembang in South Sumatera. The big players of Cinema Businesses in Indonesia consists of PT. Graha Layar Prima (CGV Cinema), PT. Cinemaxx Global Pacific (Cinemaxx), PT. Nusantara Sejahtera Raya (Cineplex 21), Platinum Cineplex, and many local player of cinema business are popping in this time.

South Sumatra province is one of the areas with high cinema enthusiasts. Cinema business growth in the last 3 years in South Sumatra reached 100%, which contained of 6 theaters in 2016 and becomes 12 in 2018. In Palembang city, there were also 3 new cinema opened during 2016 to 2018, and all of them is CGV Cinema.

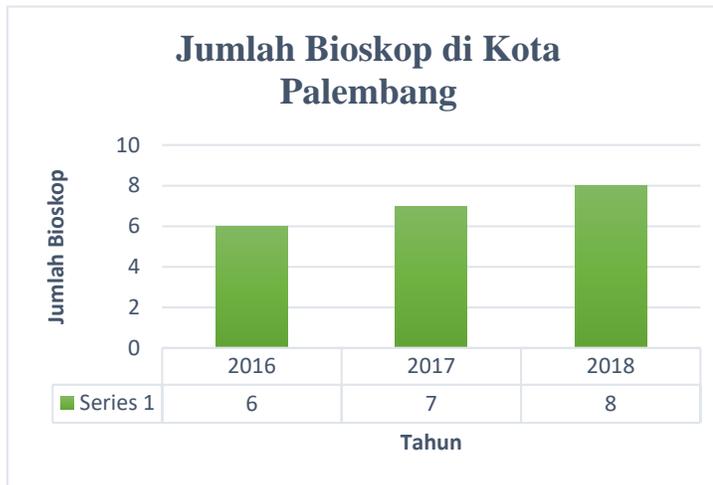


Figure 1. Business Growth Theaters in Palembang Year 2016-2018

Based on Figure 1, we could notice that in Palembang city there was one new cinema appeared every year. The growth of cinema in the city of Palembang is dominated by PT. Graha Layar Prima (CGV Cinema), which in 2016 opened the first cinema at Social Market, second CGV Cinema in 2017 located at Transmart Palembang, and third cinema in 2018 opened at PTC Mall Palembang. In the Cinema business, competition is unavoidable between one Cinema with the other Cinema. In terms of movie type, all cinemas get the same film, then to be able to attract customers, cinema player should have the advantage in other factors, for example in terms of comfort, cleanliness of the cinema, the price offered to customers, food and beverage options, and also with facilities at the cinema.

The interview result with one of Manager On Duty at the CGV Cinema PTC, Mr. Aminullah, there are still some complains from customers of CGV Cinema leading to customer dissatisfaction. Complaints by CGV Cinema customers are contained of cleanliness and service from staff, which are part of the Feel Marketing. Other example of customers' complains of hygiene is the cleanliness of the restroom, the restroom are not always maintained because not all customers use the restroom cleanly, but according to Mr. Aminullah, the hygiene team of CGV clean the restroom every 1 hour. Other examples of complains coming from the service staff, not every staff could control the tone and vocabulary to the customer, so that there are customers who still feel offended by the services of the staff CGV Cinema.

In this research, there were information obtained from the interviews with several customers of CGV Cinema. According to one customer named Rico, CGV has an alternative of purchasing the movie ticket (part of the Act Marketing), online ticket purchasing and also CGV has ticket machines that prints paid ticket automatically, unfortunately there are only two automatic ticket machines that still could not overcome the long queue during weekends because the number of visitors is prodigious. According to other sources, named Tania, all facilities and service of CGV has been very good, but the CGV theater seats in the Social Market is less convenient because it still uses the hand pads

with plastic material, which makes our hand less comfortable (part of the Marketing Sense).

Based on the information gathered from CGV Cinema Staff and customers, there are problems that are part of the Strategic Experiential Modules (SEMS), and as the previous studies have different results from one to each other, so researcher is interested to conduct research with the title: "The Effect of Experiential Marketing on Customer Satisfaction at CGV Cinema in Palembang".

II. IDENTIFY, RESEARCH AND COLLECT IDEA

Experiential Marketing

experiential marketing is the concept of offering products and services by growing emotional element to consumers resulting from the situation experienced by consumers (Schmitt, 2014).

According to Schmitt, 2011, dividing the experiential marketing approach or Strategic Experiential modules consists of five types:

1) Sense (The five senses)

Sense is something that is tangible and also the taste of a product that can be detected by the five senses which includes sound, smell, sight, taste, and touch. Sense has a function to distinguish one product from another product to convince consumers to grow the value to the product or service.

2) Feel (Feelings)

Feel is associated with emotions and feelings innermost of consumers. Feel campaign is often used to build consumer emotions slowly. When consumers feel good about the product and the company, the consumer will be happy to use the product, otherwise if consumers are not happy with a product, the consumer will not use the product and then will choose another product.

3) Think (Way of Thinking)

One method that is commonly used by the company is Think marketing, where this is the way taken by the company to make the commodity as an experience (experience) to perform continuous customization.

4) Act (Actions)

Marketing Act is the type of experience that aims to influence behavior, lifestyle and interaction with consumers. Act of marketing designed to create consumer experiences in relation to the physical body, lifestyle and interaction with others.

5) Relate (linkage)

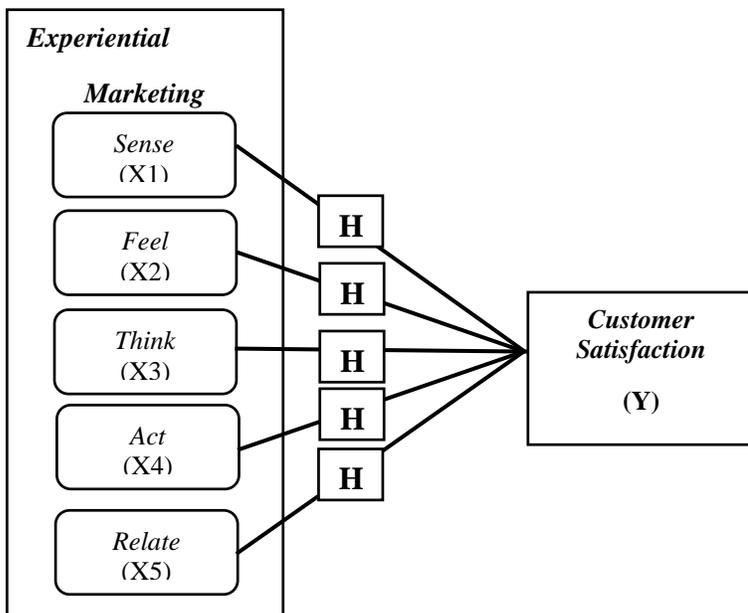
relate connect individual customers with society or culture. Relate the main attraction deepest desire for customers to the establishment of self-improvement, socio-economic status and image. Relate campaign shows a group of people who are the target customers where a customer can interact, connect and share the same pleasure.

Customer Satisfaction

The success of a company can be seen from the level of satisfaction felt by consumers about the products offered. Companies can know that their performance has been good and in line with expectations with a view from the side of customer satisfaction itself. According Sunyoto (2013: 35), consumer satisfaction can be defined as the level of consumer feelings after seeing the benefits of a product or a company's performance compared with expectations of consumers themselves

III. RESEARCH ELABORATIONS

Research Conceptual



Research hypothesis

Once we go into the background, knowing the formulation of the problem, determine research objectives, seeking a theoretical basis, and establish a theoretical framework, the hypothesis in this study are as follows:

H1 : *Sense* positive and significant impact on Customer Satisfaction

H2 : *Feel* positive and significant impact on Customer Satisfaction

H3 : *think* positive and significant impact on Customer Satisfaction

H4 : *Act* positive and significant impact on Customer Satisfaction

H5 : *relate* positive and significant impact on Customer Satisfaction

Research Methods

A. Types and Sources of Data

Data used in this study is qualitative data in the form of a questionnaire in kuantitatifkan statements by the use of a Likert scale. Sources of data in this study is the primary data, ie data collected by researchers obtained directly from observations and the results of questionnaires completed by respondents,

B. Population and Sample Research

The population in this study are all customers CGV Cinema Theaters Palembang from year 2017 to 2018. According Hair (2015) who argued that the appropriate number of samples is 100 to 200 respondents, where there are 30 questions in the questionnaire in this study, so the sample size is five times the number of questions or as many as 150 respondents.

C. Data analysis method

Methods of data analysis used in this study is qualitative data obtained from questionnaires were quantified so that it can be processed by breaking into the composition of categories, which are then analyzed using multiple linear regression analysis.

IV. RESULT AND FINDING

Validity of Test Results

Below are the results of testing the validity of this research:

Table 1. Results of Test Validity

Indicator	product Moment Pearson's	Sig.	α	Information
X1.1	0,531	0,000	< 0.05	valid
X1.2	.652	0,000	< 0.05	valid
X1.3	0.578	0,000	< 0.05	valid
X1.4	0.508	0,000	< 0.05	valid
X1.5	0,496	0,000	< 0.05	valid
X2.1	0.498	0,000	< 0.05	valid
X2.2	0.615	0,000	< 0.05	valid
X2.3	0,548	0,000	< 0.05	valid
X2.4	0.538	0,000	< 0.05	valid
X2.5	0.649	0,000	< 0.05	valid
X3.1	0.614	0,000	< 0.05	valid
X3.2	0,556	0,000	< 0.05	valid
X3.3	0.718	0,000	< 0.05	valid
X3.4	0.507	0,000	< 0.05	valid
X3.5	0.541	0,000	< 0.05	valid
X4.1	0.511	0,000	< 0.05	valid
X4.2	0.589	0,000	< 0.05	valid
X4.3	0.446	0,000	< 0.05	valid
X4.4	0,523	0,000	< 0.05	valid
X4.5	0,646	0,000	< 0.05	valid
X5.1	0.582	0,000	< 0.05	valid
X5.2	0.573	0,000	< 0.05	valid
X5.3	0.677	0,000	< 0.05	valid
X5.4	0.479	0,000	< 0.05	valid
X5.5	0.430	0,000	< 0.05	valid
Y.1	0.539	0,000	< 0.05	valid
Y.2	0.437	0,000	< 0.05	valid
Y.3	0.573	0,000	< 0.05	valid
Y.4	0.529	0,000	< 0.05	valid
Y.5	0.413	0,000	< 0.05	valid

Source: Adapted from Questionnaire, 2019

Based on the results of Table 1 explained that the indicators of each independent variable that sense, feel, think, act and relate and the dependent variable that customer satisfaction has a significant value $0.000 < 0.05$, so that the indicators in this study variables declared invalid.

Reliability Test Results

Here are the results of reliability testing in this study:

Table 2. Results of Test Reliability

variables	Cronbach's Alpha	Cut t Off	N of Items	Information
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Sense (X ₁)	0.704	>	5	reliable
Feel (X ₂)	0.715	>	5	reliable
think (X ₃)	0.727	>	5	reliable
Act (X ₄)	0.696	>	5	reliable
relate (X ₅)	0,703	>	5	reliable
Customer Satisfactio n (Y)	0.647	>	5	reliable

Source: Adapted from Questionnaire, 2019

Based on the results of Table 2 above, the reliability test results variables sense, feel, think, act and relate (X) and variable customer satisfaction (Y) showing values above 0.6, which means that the data that have been tested are reliable.

Normality Test Results

The test results can be presented as follows:

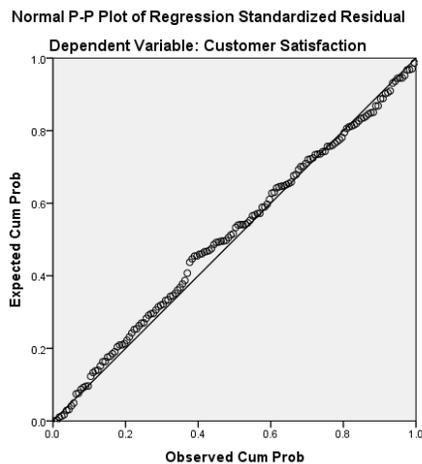
Table 3. Test of Normality

Below are the results of the tests for normality in this study:

One-Sample Kolmogorov-Smirnov Test		unstandardized residual
N		150
normal Parameters	mean	.0000000
	Std. deviation	1.79854855
Most Extreme Difference	Absolute	.067
	positive	.032
	negative	-.067
Kolmogorov-Smirnov Z		.067
Asymp. Sig. (2-tailed)		.198

Source: Adapted from Questionnaire, 2019

It was concluded from the results of Table 3 above that value or significance probability for each variable is greater than 0.05, so it can be stated that the data in this study normal distribution.



Source: Adapted from Questionnaire, 2019

Figure 2. Normality Test Results

Seen from Figure 2 above that the data tested had normal distribution and satisfy the assumptions of normality, because the data is scattered in the direction diagonal line and just spread around that line.

Test Results Multicollinearity

Here are the results of testing multikolinieritas in this study:

Table 4. Test Results Multicollinearity

<i>Test of Multikolinierity</i>	VIF	Cutt Off	Information
Sense(X1)	1,125 < 10		Not Happen Multicollinearity
Feel (X2)	1,290 < 10		Not Happen Multicollinearity
Think (X3)	1220 < 10		Not Happen Multicollinearity
Act (X4)	1,342 < 10		Not Happen Multicollinearity
Relate (X5)	1,257 < 10		Not Happen Multicollinearity

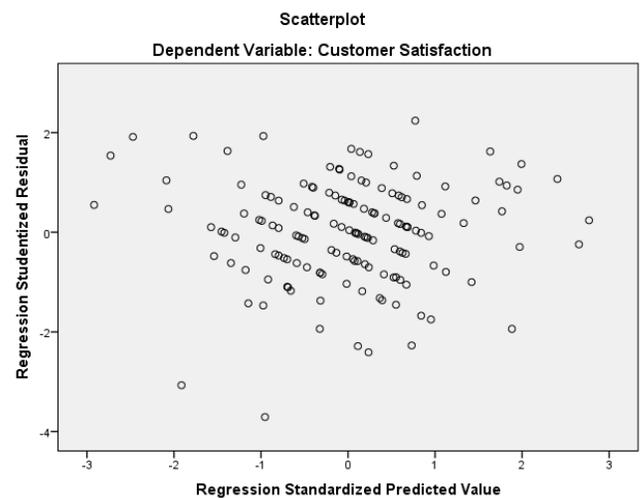
Think (X3)	1220 < 10	Not Happen Multicollinearity
Act (X4)	1,342 < 10	Not Happen Multicollinearity
Relate (X5)	1,257 < 10	Not Happen Multicollinearity

Source: Adapted from Questionnaire, 2019

Based on the results of Table 4 shows that there is no multicollinear

Test Results heterokedastisitas

Here are the results of testing heteroscedasticity in this study:



Source: Adapted from Questionnaire, 2019

Figure 3. Test Results Heteroskidastity

See from Figure 3. On top of that not happening heteroscedasticity in the data tested, because the scattered data has no clear patterns and dots on the image spread above and below the number 0 on the Y axis

Results of Multiple Linear Regression Analysis

In this study it has been found the results of the regression calculation as below.

$$Y = 4.819 + 0,200X_1 + 0,165X_2 + 0,159X_3 + 0,164X_4 + 0,143X_5 + 1.719e$$

Based on the above results, it can be seen a positive constant value of 4819 explains that there is a positive influence between independent variables sense (X1) Of 0.200, feel variables (X2) Amounted to 0.165, think variables (X3) Amounted to 0.159, act variable (X4) Amounted to 0.164, relate variables (X5) Amounted to 0.143 customer satisfaction on the dependent variable (Y).

Test Results Correlation Coefficient (R) and the coefficient of determination (R²)

Below are the results of testing of correlation (R) and the coefficient of determination (R²) in this research:

Table 5. Test Results Correlation Coefficient (R) and the coefficient of determination (R²)

Model Summary ^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.594	0.353	.330	1,830

Source: Adapted from Questionnaire, 2019

Based on the results in Table 5, the results of the correlation coefficient test (R) of 0.594 or 59.4% and the number of R square () is 0.353 or 35.3%, this figure shows how R² sense, feel, think, act and relate jointly influence on customer satisfaction in the cinema CGV Cinema in the city of Palembang.

The above figures also show how the variables, sense, feel, think, act and relate provide information needed to explain customer satisfaction and together amounting to 35.3% while the remaining 64.7% is influenced by other factors.

Hypothesis Test Results

Model Eligibility Test Result (Test F)

The following are the results of the calculation of the variable F testsense, feel, think, act and relate(X) on customer satisfaction (Y).

Table 6. Results of Feasibility Model (Test F)

ANNOVA ^b					
Model	Sum of Squares	Df	mean Square	F	Sig.
1					

1	Regression	262 712	5	52 542	15 698	.000 a
	residual	4581.982	144	3,347		
	Total	744 693	149			

Source: Adapted from Questionnaire, 2019

Judging from Table 6 above, the test results together, obtained a value of 15 698 is greater than the value at the 94% confidence level. Then didapatlah result of that is 144. So from the results that have been obtained, it can be concluded that F_{hitung} > F_{tabel} sense, feel, think, act and relate(X) together have an influence on customer satisfaction (Y),

Individual Test Results Parameter Significance (t test)

Below are the results of test calculations T.

Table 7. Test Results Individual Parameter Significance (t test)

Model	coefficients			t	Sig.
	unstandardized coefficients	Std. Error	standardized coefficients		
1	B	Std. Error	beta		
	(Constant)	4819	1,719	1,803	0,000
	Sense	.200	0.057	0,249	0,001
	Feel	0.165	0.068	0.185	0,016
	think	.159	0.065	.180	0,016
	Act	0.164	0.075	.170	0,030
	relate	0.143	0.069	.157	0,039

Source: Adapted from Questionnaire

T test results in Table 7 above, the variable sense (X1) Has a beta value of 0.249 with a significant value of 0.001, feel variables (X2) Has a beta value of 0.185 with a significant value of 0,016, think variables (X3) Has a beta value of 0.180 with a significant value of 0,016, act variable (X4), Has a beta value of 0.170 with a significant value of 0,030, relate variables (X5) Has a beta value of 0.157 with a significant value of 0.039.

Thus the results of the t test showed that the variables sense, feel, think, act, and relate has a positive and significant impact on customer satisfaction.

V. CONCLUSIONS AND SUGGESTION

Conclusion

Results of testing with multiple linear regression analysis with five independent variables that sense, feel, think, act and relate and one dependent variable has the result that the customer satisfaction:

1. Sense positive and significant impact on customer satisfaction at the CGV Cinema theaters in the city of Palembang.
2. Feel positive and significant impact on customer satisfaction at the CGV Cinema theaters in the city of Palembang.

3. *think* positive and significant impact on customer satisfaction at the CGV Cinema theaters in the city of Palembang.
4. *Act* positive and significant impact on customer satisfaction at the CGV Cinema theaters in the city of Palembang.
5. *relate* positive and significant impact on customer satisfaction at the CGV Cinema theaters in the city of Palembang.

Suggestion

Based on the results that have been obtained, the advice of researchers are as follows:

1. Share CGV Cinema Party

The results of this research must come from respondents associated with a variable number of experiential marketing, the variable sense, feel, think, act, and relate, in which the results of this study reveal the responses of respondents who thought to boost customer satisfaction on the CGV Cinema ,

In the sense variables, the respondents argued that the quality of the room at the CGV Cinema aroma can be improved by adding perfume fragrance and calming room. At the feel of variables, the respondents provided suggestions to improve comfort by replacing the seat in the waiting room and also add automatic ticket printing machines. Think of the variable, the respondents provided suggestions for CGV Cinema in order to add a promo to its members, for example, offers discount tickets on certain days or even a special promo price for food and drinks. In the variable act, the advice of the respondents were CGV retained and can improve the quality of social media and websites already owned today. In Variable relate,

In this study, a regression model showed that the variable sense had the highest scores among the five variables experiential marketing, which means that if the CGV Cinema improve aspects of sense then that will impact most significantly to the increase in customer satisfaction at the CGV Cinema compared to other aspects of experiential marketing.

2. For Further Research

For further researchers who are interested in researching this study should examine beliefs about corporate image, customer loyalty, etc., and can expand the sample to amplify and produce good research.

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The Effect of Malting On Sorghum and Maize for Weaning Food Production

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Abstract

The study focused on the effect of malting sorghum and soaking of maize for weaning food with a view to producing an affordable and nutritious complementary food for low – income families. Seven formulations were prepared as sample A to G. The samples were subjected to proximate, functional, anti – nutritional factors and sensory evaluation. The result from proximate analysis showed that the moisture content ranges from 8.36±0.21 to 8.70±0.21. Sample B has the highest moisture content of 7.80±0.57 and sample E has the lower moisture content of 8.70±0.21; sample F has higher protein content of 13.73±0.015 while sample C has the lower protein content of 9.09±0.14. The carbohydrate content ranged from 72.17 – 73.98, sample G has the highest carbohydrate content of 73.98. The Energy value ranges from 343.64 – 386.57; sample C has the highest energy value of 386.57 while sample B has the lowest content of energy value of 343.64. The result of functional properties of the samples shows that the pH of the samples ranged from 4.17 – 5.68. In which sample B has the highest pH of 5.68 and sample B has the lower pH of 4.17. The anti-nutritional analysis shows that sample B has a higher content of tannin of 14.33^o and sample A has the lower tannin content of 5.56^a. The tasters found the samples acceptable in terms of appearance, taste, flavor, texture and aroma when compared with homemade. In conclusion, the study has shown that a cheap and nutritious complementary food could be produced from sample F.

Keywords: malting, soaking, nutritious, proximate, functional, anti-nutritional, sensory evaluation.

INTRODUCTION

Cereals grains belong to the graminæa family and they are cultivated for their edible components. They are grown in greater quantities and provide more Food energy worldwide than any other type of crops. They are therefore referred to as staple crops. In their natural form (as in whole grain) they are rich source of vitamins, minerals, carbohydrate, fats & oil and protein (Belton and Taylor, 2002). Cereals are used in the production of common foods in Nigeria, such as Ogi, Tuwo and Quaker, corn flakes, custard, and also used in brewing industries for alcoholic and non – alcoholic beverages. Meals produced from maize are suitable for human consumption with or without further cooking and they are usually eaten weaning food such as ogi.

Weaning has been described as the gradual substitution of the mother's milk with solid and semi – solid food in infant's diet in order to fulfill their growing needs. It is a process starting with the introduction of complementary foods and ending with the complete cessation of breastfeeding. Many mothers especially in developing countries breastfeed for 12 months while others breastfeed for up to 24 month (kazim, and Karim, 1979; Adenuga 2010). It is a food, made more or less from processed grain, usually use in feeding babies at the age of 6 -12 month. It is often served hot, usually mixed with milk (e.g. soya milk, cow's milk almond milk.) water or yoghurt and sometimes fruits but, while some cereals such as oatmeal may be served hot.

Weaning is the substitution of solid foods or special childhood foods or breast or bottled milk. The weaning period is thus defined as the total period during which breast milk is being replaced by any other foods. Proper weaning foods should supply certain vitamins and minerals not present in breast milk, while providing additional calories. However, with the addition of food other than breast milk in the developing countries, there is a marked increase in the danger of gastroenteritis as a potential fatal disease. During weaning, the infant living in an overcrowded, unhygienic environment is at risk of developing acute diarrhea disease with its debilitation, and nutritional hazards, directly or indirectly leading to death.

Ogi is a common weaning food among the Western and Eastern parts of Nigeria than Southern part. It is an example of traditional fermented food, which has been upgraded to a semi –solid scale (Achi, 2005). It is a product of maize and sorghum, which is prepared by steering of grinded maize in boiled water until it becomes semi – solid fluid. The same preparation goes to sorghum, only that sorghum is steered in boiled water for a longer period than that of maize. Maize and sorghum are not good sources of protein, but sorghum has better protein content than maize but with poor digestibility. Gelatinized ogi is called pap and this is mainly used as a traditional infant weaning food as well as breakfast meal for many adult. This slurry absorbs a large quantity of water and swells up greatly when mixed with either cold or hot water. The foods are therefore bulky due to the high viscosity. Due to the fact that high

bulk reduces food intakes by the child, it is often result in malnutrition. This can be solved by the protein complementation, a term which describes the combination of protein from different food sources (Inyang and Idoko 2006).

Malt is germinated cereals grains which have been dried in a process known as malting. The grains are made to germinate by soaking in water and are then halted from germinating further; this is achieved by drying with hot air. Malting grains develop the enzymes required to modify the grain's starches into sugars including monosaccharide such as glucose or fructose and disaccharides such as lactose, sucrose or maltose. It also develops other enzymes, such as protease, which can be used by yeast. Therefore, malting of sorghum improves both the protein quality and digestibility. Also, malting reduces anti – nutritional factors and increases soluble sugar.

MATERIALS AND METHODS

Maize and sorghum were purchased at the local market in Ondo, Ondo state, Nigeria. The preparation of weaning food (Ogi or Akamu) maize were cleaned, washed thoroughly and soaked in water for 3 days while the soaked water was changed over time. It was wet milled and sieved through muslin cloth. The filtrate was allowed to settle down; the water was discarded after which the semi – solid was dried in the cabinet dryer at a temperature of 50°C for 2hrs. These are known as Ogi flour which was then packaged for further analysis. Malted sorghum was prepared with sorghum grains cleaned, immersed in water and washed twice during which glumes and chaff was removed. The water was drained off. First steeping took place for 6 hours after which it was drained and aerated for 3 hours. The same goes for the second steeping. The third steeping began by adding fresh water and was also steeped for 6 hours. The liquor was drained while germination process begins to take place which lasted for four days at room temperature. After the 4th day of germination, the green malt was aerated for 4hrs and transfer into the cabinet dryer for drying; this process was to stop the growth of the green malt at the end of germination. This was agitated in the dryer at 24hrs interval. After drying, it was milled and packaged.

Table 3.1 Formation of weaning food from soaked maize flour and malted sorghum flour.

Samples	Maize flour	Sorghum flour
A	100	0
B	0	100
C	10	90
D	20	80
E	30	70
F	40	60
G	50	50

A ---- 100% soaked maize, B ---- 100% malted sorghum, C ---- 90% malted sorghum, 10% soaked maize, D ---- 80% malted sorghum, 20% soaked maize, E ---- 70% malted sorghum, 30% soaked maize, F ---- 60% malted sorghum, 40% soaked maize and G ---- 50% malted sorghum, 50% soaked maize.

Proximate analysis

The proximate analyses of the formulated samples were carried out using the standard procedure of Association of Analytical Chemist (AOAC, 2002). Carbohydrate content was determined by subtracting the value of the analyzed components i.e. Moisture content, protein, crude fat, ash content, crude fibre, from 100%, and was expressed in percentage. 100 - % (crude Protein + total ash + crude fibre +crude fat +Moisture content). Energy value was determined by a standard calculation using Atwater factor.

$$\text{Protein} \times 4 \text{ joule / g} + \text{carbohydrate} \times 4 \text{ joule / g} + \text{Fat} \times 9 \text{ joule / g}$$

Physical Properties determination

The following physical properties were determined; pH, least gelation, swelling capacity, bulk density, Water absorption capacity, Oil absorption capacity.

pH

The pH was measured by making 1% W/V suspension of the sample in distilled water. The suspension was mixed thoroughly and the pH was measured with a combo pH meter (model HI 98129, Hanna Instrument, Italia).

Least gelation capacity (LGC)

Least gelation capacity was determined by the method described by Coffman and Garcia (1977). Ten suspension of the flour blended (2%, 4%, 6%, 8%, 10%, 12%, 14%, 16%, 18%, and 20%) (W/V) in 5 ml of distilled water was prepared in the test tubes. The test tubes containing the suspension were heated in a boiling water bath (THELCO, model 83, USA) for 1h. The tubes and the content were cooled rapidly under running water, and then cooled further for 2hrs at 4°C. Next, the tube was inverted to see if the content would fall or slip off. The least gelation concentration is that concentration when the sample from the inverted test tubes does not fall of slip off.

Swelling power and solubility index

Swelling power and solubility was determined by Takashi and Sieb (1988) method. It involves weighing 1g of flour blend sample into 50 ml centrifuge tube. Fifty ml of distilled water was added and mixed gently. The slurry was heated in a water bath at 70°C, 80°C,

90°C, and 100°C respectively for 15 min. During heating, the slurry was stirred to prevent clumping of the flour. On completion of 15 min, the test tube containing the paste was centrifuged at 3000 rpm for 10 min using centrifuge. The supernatant was decanted immediately after centrifuging. The weight of the sediment was taken and recorded. The moisture content of the sediment gel was therefore determined to get the dry matter content in the gel.

$$\text{Swelling power} = \frac{\text{weight of wet mass sediment}}{\text{Weight of dry matter in the gel}} \times 100$$

$$\text{Solubility index (\%)} = \text{Weight of dry solid after drying} \times 100$$

Bulk density

The bulk density was determined using Ukpaibi and Ndimele (1990). Ten grams of each sample was weighed and poured gently into 25ml measuring cylinder. The level of the sample in each cylinder was traced out in ml and the bulk density was calculated.

$$\text{Density} = \frac{\text{mass of sample}}{\text{Volume of sample in the cylinder}}$$

Water absorption capacity (WAC)

The water absorption capacity was determined at room temperature using a combination of the AACC (1995) method and those of Murkowski and Kozłowska (1981), and Sosulski (1962). Two grams of the sample was dispersed in 20ml of distilled water. The content was mixed for 30s at every 10mins using a glass rod and after mixing five times, centrifuged at 4000rpm for 20 min. The supernatant was carefully decanted and the content of the tube were allowed to drained at 45° angle for 10 min and then weighed. The water absorption capacity was expressed as percentage increase of the sample weight.

Oil absorption capacity (OAC)

The oil absorption capacity was determined at room temperature using a combination of the AACC (1990) method and those of Ruthkowski and Kozłowska (1981), and Sosulski (1962). Two grams of the sample was dispersed in 20ml of distilled water. The content was mixed for 30s at every 10mins using a glass rod and after mixing five times, centrifuged at 4000rpm for 20min. The supernatant was carefully decanted and the corner of the tube were allowed to drained at 45°angle for 10 minutes and then weighed. The water absorption capacity was expressed as percentage increase of the sample weight.

Determination of tannin content

Gravimetric determination of tannin was done according to the method described by Makkar *et al.*, (1996). Defatted samples 0.2g was weighed into a test tubes and the tannin was extracted in 0ml 70% acetone. It was then placed in iced water bath for 10min to allow for complete extraction of tannin. About 0.2ml of the filtrate was placed in test tube and made up to 1ml with distilled water; 2.5ml of 20% Na₂CO₃ and 0.5ml folin's reagent diluted 1:1 with distilled water were added and the content was mixed properly. The solution was incubated for 45mins at room temperature to develop color (blue color). Standard tannic acid solution ranging from 0.01-0.05mg/ml was also prepared, followed by the addition of 2.5ml Na₂CO₃ and 0.5ml folin's reagent. The absorbant of each samples was read at wavelength 700nm using a Corning Colorimeter 253, Corning Ltd, Essex, England, against a agent blank. The tannin content in each samples was deduced from the standard tannic curve.

Determination of Oxalate

The determination was done according to Day and Underwood (1986). 1g of the malted sorghum and the soaked maize samples were put into separate plastic bottle followed by the addition of ml of 0.1N H₂SO₄. The contents was mixed properly ad allowed to extract from 1hour with constant agitation using a mechanical shakers. This was then filtered and 25ml of the filtrate was related with 0.1 ml KMnO₄ while hot (80-90°C) until a purple color is observed at the end point. The titre value was the multiplied by 0.9004 to give the result expressed as mg/g.

Determination of Phytate

Phytate was determined according to the method of Young and Greaves, (1990).

4g of the samples were soaked in 100ml; of 2% HCL for 3hours and then filtered. 25ml of the phytate was placed in the conical flask. A 5ml of 0.3% ammonium thiocyanate solution was added as an indicator and 53.3ml of distilled water was also added to give it proper acidity. This was concentrated with standard FeCl₃ solution until a brownish yellow color persists for five minutes.

$$\text{Phyate in mg / 100mg} = \text{titre value} \times 564.11$$

Sensory evaluation

The samples were reconstituted into paste, coded and served to ten number semi-trained panelist using nine point Hedonic scale. Each panelist was given codes samples and was asked to evaluate for appearance, taste, aroma, texture, and the overall acceptability of the sample. The hedonic rating scale of 1 to 9 where 1 = dislike extremely, 5 = neither like nor dislike and 9 = like extremely.

Statistical analysis

Results were statistically analyzed by ANOVA and the means separated by Duncan multiple change technique using SPSS 16 computer package.

RESULTS AND DISCUSSION

The result of the proximate analysis of the malted sorghum and soaked yellow maize are shown in Table 4.1. The moisture content of the samples ranged from (8.36±0. 21 to 8.70±0.21).The values show that 90% of malted sorghum blended with 10% of soaked yellow maize which is sample C had the highest moisture content 8.55±0.26 compare to 100% malted sorghum and 100% maize. The result indicated an increase in moisture content with increase in addition of malted sorghum. This moisture content is within the range

speculated for weaning foods. Higher moisture content indicates increased in susceptibility to spoilage and thus reduces shelf life, the moisture content analysis done on this samples shows all sample exhibit good keeping quality and longer shelf life.

The total ash content gives an indication of the mineral composition of the samples. The ash content ranges from (0.23±0.11 to 1.25±0.12). The total ash content of the malted sorghum and soaked yellow maize shows that 100% of malted sorghum which as great improved by malting, the lowest ash content is malted sorghum flour with 50% of soaked yellow maize flour. Highest ash content indicates a higher mineral composition.

Crude fibre, the result shows that all samples contain crude fibre. The content fibre content ranges from 0.65±0.10-1.15±0.06). The samples 100% of malted sorghum flour has 1.15 ± 0.06 of fibre content while malted sorghum flour of 50% blended with 50% of soaked maize flour has the lowest fibre content the maize was dehull during the processing. The low crude fibre of foods makes it more digestible for children (Adenuga, 2010) i.e. low fibre content food enhance nutrient digestibility.

Crude fat content of the samples ranges from (3.70±0.06-5.60±0.12). The value shows that 100% of malted sorghum flour has a lower fat content due to the fact that the production of the samples was malted. The fat content increased in soaked yellow maize flour due to the fact that the protein content in 100% of maize is higher than that of malted sorghum. When fat is much in a diet, it causes rancidity and hence spoilage of thee diets.

Protein content of the samples ranges from (9.09±0.14-13.73±0.08). The values shows that 90% of malted sorghum flour blended with 10% of soaked yellow maize flour has the lowest protein content of 0.09± 0.14 which was due to the fat that malted sorghum flour has a the high moisture content, and moisture content has an influence on the protein content. The protein content increases with the addition of soaked yellow maize flour to the malted sorghum flour. Protein is needed for growth and development by replacing worn – out tissues. When this is insufficient, it leads to malnutrition and death may occur when not treated. Therefore, the moisture content of any food composition must be dried to nearest minimum.

Carbohydrate and energy content, the value of the carbohydrate ranged from (72.17% - 75.52%). Sample 90% of malted sorghum flour has the highest content. The energy content is much more due to carbohydrate content. It is important to have an easily and readily digested carbohydrate than to avoid using protein as a source of energy, carbohydrates are energy giving food. Energy is needed by the babies to perform daily activities. In this work, soaked yellow maize flour as the highest protein content so it is advisable to take soaked maize. A balance meal contains the essential food nutrients in their correct proportion. The essential food nutrient includes carbohydrate, protein, fats as well as minerals, vitamins and water.

Table 4. 1. The proximate Composition of the Formulated diets

Sample	Moisture (%)	Ash (%)	Fat (%)	protein (%)	fibre (%)	carbohydrate	Energy (Kcal)
A	8.69±0.20	0.55±0.10	4.04±0.10	13.29±0.015	0.34±0.15	73.98	385.44
B	8.70±0.21	1.25±0.12	5.6±0.12	11.14±0.8	1.15±0.10	72.17	343.64
C	8.55±0.26	0.23±0.15	5.35±0.15	9.086±0.14	0.10±0.10	75.52	386.57
D	8.46±0.17	0.39±0.17	34.75±0.17	10.00±0.17	0.98±0.06	75.33	360.32
E	8.36±0.21	0.325±0.10	3.97±0.13	13.67±0.15	0.90±0.10	72.68	381.13
F	8.52±0.15	0.24±0.10	3.86±0.10	1373±0.08	0.65±0.06	73.16	362.12
G	8.46±0.17	0.23±0.11	3.7±0.06	13±0.05	0.69±0.06	73.86	380.74

A ---- 100% soaked maize, B ---- 100% malted sorghum, C ---- 90% malted sorghum, 10% soaked maize, D ---- 80% malted sorghum, 20% soaked maize, E ---- 70% malted sorghum, 30% soaked maize, F ---- 60% malted sorghum, 40% soaked maize and G ----50% malted sorghum, 50% soaked maize.

4.2. Functional Properties analysis

The functional properties of determined are presented in table 4.2

The pH of the sample ranges from (4.17 – 5.68). Sample B has the higher pH of 5.68 and sample A has the lower pH of 4.1 i.e. the most acidic of the sample which is probably due to the effect of malting. Malting increases the acidity of food because of the action of the hydrochloric enzymes (Gernah *et al*, 2010).

The bulk density of the samples ranges from 14.50 – 15.87, sample D has the higher bulk density of 15.87 and the sample has the lower bulk density of 14.50. Reduction in the bulk density of sample C would be an added advantage in the preparation of supplementary food (Akubor and Obiegbuna, 1999: Adetuyi *et al*, 2009) low bulk density in food is desired where packaging is a serious problem (Ikujenlola, 2008)

The least gelation capacity of the sample ranges from 0.2 -2.4. Sample A has the higher least gelation capacity of 2.4 and sample B has the lower least gelation capacity of 0.02.

The swelling capacity (SC) ranges from 0.1 – 0.9. Sample B has the higher (SC) of 0.9 and Sample E has the lower (SC) of 0.1

The water absorption capacity (WAC) ranges from 2.5 – 3.2. Sample C and F has the higher (WAC) of 3.2 while Sample A has the lower (WAC) of 2.5 the reduction in the WAC of the sample A agreed with the findings of Tatsadjieu *et al*, (2004). Increase in temperature also increases the water absorption capacity.

The oil absorption capacity (OAC) ranges from 1.2 – 3.0, Sample E has the higher (OAC) of 3.0 and sample G has the lower (OAC) of 1.2

4.2 Physical Properties of the formulated diet.

Sample	pH (m/v)	Least gelation	W.A.C MI	O.A.C ml	Swelling capacity (ml)	Bulk density (g / ml)
A	4.17	0.8	2.5	2.9	0.3	15.33
B	5.68	2.4	2.6	2.9	0.9	14.53
C	5.55	2.2	3.2	2.9	0.5	14.50
D	5.33	2.0	3.0	2.85	1.0	14.87
E	5.08	1.6	3.1	3.00	0.1	15.10
F	5.14	1.2	3.2	1.8	0.3	15.77
G	4.84	1.0	3.1	1.2	0.5	15.83

A ---- 100% soaked maize, B ---- 100% malted sorghum, C ---- 90% malted sorghum, 10% soaked maize, D ---- 80% malted sorghum, 20% soaked maize, E ---- 70% malted sorghum, 30% soaked maize, F ---- 60% malted sorghum, 40% soaked maize and G ----50% malted sorghum, 50% soaked maize.

4.3 Anti nutritional factor analysis.

The anti – nutritional factors determined are presented in Table 4.3.

The oxalate content ranged from 12.3- 21.67. Sample A contain higher content of oxalate 21.67 and sample B has the lower oxalate content 12.33, therefore the sample with the lower oxalate content should be consume mostly. The tanning content of the sample ranges from 5.67- 14.33, sample A has the lowest content 5.67 and sample B has the higher content 14.33. Therefore sample with lower tannin content should be used for weaning, because tannin inhibit the digestion and absorption of food (Oboh and Akindahunsi, 2003). The phyate content ranged from 21.00-31.33, Sample A has the lower phytate content of 21.00 and sample B has a higher content of 31.33, so, therefore sample A is more preferable for weaning child because of its lower content of phytate.

Table 4.3. Anti-Nutritional properties of samples

SAMPLE	OXALATE (mg/100g)	TANNIN(mg/100g)	PHYTATE(mg/100g)
A	21.67 ^C		26.33 ^b
B	12.33 ^a		31.33 ^C
C	19.67 ^{bc}		22.00 ^a
D	16.33 ^b		20.33 ^a
E	17.67 ^{bc}	12.33 ^{bc}	21.33 ^a
F	18.00 ^{bc}	10.33 ^b	21.00 ^a
G	16.67 ^b	10.33 ^b	28.67 ^b

Values are means of triplicate reading with different superscript in the same column are significantly different (P < 0.05). A ---- 100% soaked maize, B ---- 100% malted sorghum, C ---- 90% malted sorghum, 10% soaked maize, D ---- 80% malted sorghum, 20% soaked maize, E ---- 70% malted sorghum, 30% soaked maize, F ---- 60% malted sorghum, 40% soaked maize and G ----50% malted sorghum, 50% soaked maize.

Sensory Evaluation

Ten member panels were used to evaluate the sample. The panels were semi – trained but consisted of consumers who were familiar with the sample. Selection was based on interest and availability. The samples were prepared by mixing 30g blended flour in 150ml cold water. This was brought to boil to obtain gelatinization and a tea spoon of sugar was added to obtain sweetness. The panel members were seated in an open, well – illuminated laboratory. They rated the sample based on appearance, texture, flavor, taste and appeal on 9 point hedonic scale, where 9 represented like extremely and 1, dislike extremely respectively. Overall acceptability was also determined.

Data for all parameters were reported as means of ten judgments. Analysis of variance was computed for each sensory attributes as shown in table 4.4 Based on the report given by the panelists, the most preferred meal sample were chosen from the wet –milled samples. Meal prepared from 50% of malted sorghum flour blended with 50% of soaked maize flour had the highest rating of about 8.60 while the samples made from 60% of malted sorghum flour blended with 40% soaked yellow maize flour had better ratings next to the samples.

Table 4.4 Result obtained from the sensory Evaluation of the samples.

samples attributes	A	B	C	D	E	F
Aroma	4.30	4.70	4.70	6.80	8.00	8.10
Taste	4.50	5.20	5.70	6.60	8.30	8.30
Texture	4.00	4.90	5.80	6.60	7.60	8.30
Appearance	3.80	3.70	5.30	6.30	8.00	8.30
Overall acceptability	5.80	5.80	7.00	7.50	8.10	8.60

A ---- 100% soaked maize, B ---- 100% malted sorghum, C ---- 90% malted sorghum, 10% soaked maize, D ---- 80% malted sorghum, 20% soaked maize, E ---- 70% malted sorghum, 30% soaked maize, F ---- 60% malted sorghum, 40% soaked maize and G ---- 50% malted sorghum, 50% soaked maize.

CONCLUSION AND RECOMMENDATION

Conclusion

Supplementary food formulations in this study were based locally available low – cost materials commonly consumed in Nigeria. The study has shown that malting has help the anti-nutritional factors in the food that can inhibit the activity of the essential needed in them.

Recommendation

Processing such as malting should be adopted in the preparation of weaning foods.

Food is processed in form; it should be dried to the minimum and from any form of moisture in order to extend the shelf life and not to alter any nutrient

Interval of water from soaked maize every 24hrs must be maintain, because this also help to known the amount of anti-nutritional factor in them.

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Effects of methanogenic bacteria type on yield and quality of biogas from agricultural wastes.

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Abstract

In order to solve the challenges facing agricultural waste disposal and energy scarcity, several researches to convert agricultural waste to biogas and to increase biogas yield have been conducted. However, studies that establishes maximum biogas yield in conjunction with improved biogas quality are few. Therefore, in a quest to finding a more sustainable solution to the challenges facing agricultural waste disposal and energy scarcity in Nigeria, this study examined the effect of methanogenic bacteria type on yield and quality of biogas from effluents from palm oil processing (POME) and rubber processing (RPE). In this study, laboratory experiments with a sequence of 500 ml bio-digesters were performed using the different effluents inoculated with cow dung, methanogenic bacteria A and bacteria B, in seven different E:I ratios of: 5:0, 4:1, 3:2, 1:1, 2:3, 1:4 and 0:5 using the mesophilic technique. The biogas produced was captured and analysed for its composition using a biogas analyser. Results from the study, reveals that inoculation led to a significant (about 6-fold) increase in the yield of biogas from anaerobic digestion of POME and RPE. Inoculation also enhanced the quality of the biogas generated. The cocci spp. gave higher biogas yield of 1610 cm³ and 1985 cm³ respectively from equal volumes of POME and RPE. Better quality biogas with methane content of 69.98 and 67.96% respectively for POME and RPE was also obtained with cocci spp. as compared to the bacillus spp. Anaerobic digestion of raw uninoculated RPE did not generate biogas. The best performance E: I ratio for POME in all the trials and cow dung inoculated RPE was 1:1, while RPE inoculated cocci and bacillus spp. was 3:2

Keywords: Anaerobic treatment, effluents, inoculums, biogas, POME, RPE

Introduction

Waste contribution to global anthropogenic methane emission is 20% (IEA, 2005), and methane is one of the greenhouse gases with a global warming potentials of 23 in a 100 years (IPCC, 2001). A greater portion of the waste arises from agricultural activities such as deforestation, biomass burning, rice cultivation, animal husbandry, unplanned agricultural waste disposal methods etc. Methane contribution to climatic change is around one third to half of that of carbon- dioxide (Hensen and Sato, 2001). The effect of climatic change will reduce economic development (Christopher, 2001) and increase poverty. Also, inability to effectively control the adverse effects of climatic change can ruin the possibility achieving the millennium development goal 9 (eradication of extreme poverty and hunger) (Aliyu, 2011) and goal 7 (ensuring environmental sustainability) (Hulme *et al.*, 1995). In Nigeria, agricultural sector feeds industries such as, food and beverage industries, soap and detergent, paper, plastics, textiles production and other related industries. The sector along with most of the industries it feeds do not practice proper waste disposal methods and often times, indiscriminately discharge their waste on roadside, in storm drainage canals, into nearby sea, stream, the outskirts area and surrounding land with little or no treatment. These methods are insufficient, unsustainable and harmful especially in a country like Nigeria where legitimate environmental laws are not strictly adhered to; the impact of such indiscriminate discharges may lead to gross contamination of the environment. So far, report from W.H.O estimated 335,200 deaths, occurring annually in Nigeria (a 16.70% of death cases) as a result of poor sanitation, water and hygiene related infection (Ojuri and Ola, 2010; Ojuri, *et al.*, 2014). However, the concept of waste as a useless material is rapidly changing to that of a valuable resource (Kwaghe *et al.*, 2011); especially when these wastes contain a lot of valuable chemical components with nutritional, energetic and fertilizing properties (Liang- Qiao and Wu, 2009) that are usually lost by improper waste disposal methods. If agricultural wastes are properly managed, it will maximize the benefits of nutrients available from farm waste and minimize environmental impact. Among these agricultural wastes, wastewaters constitute a major challenge. Thus, in this study effluent from palm oil processing (POME) and rubber processing (RPE) will be evaluated for their biogas generating potentials.

Effluents from palm oil processing (POME) and rubber processing (RPE) are both organic waste which are capable of releasing carbon dioxide and methane into the atmosphere. These effluents are also high oxygen depleting (Yahaya and Lau, 2013) and can

result to gross environmental pollution. Effluents released straight or some other ways into water environments will reduce their dissolved oxygen, degenerating them into unsightly, anoxia, foul-smelling and disease causing conditions thereby endangering the aquatic lives (Yahaya and Lau, 2013) and the lives of the nearby inhabitants. Thus the urgent demand for proper, sustainable and profitable waste management methods that minimizes environmental impact. Also, as a result of the limited fossil fuel reserve throughout the world, the fluctuations in their prices coupled with their combustion problems, Nigeria intends to reduce its dependence on oil and foster its economic growth through increased industrialization and agriculture (Federal Ministry of Power and Steel, 2000).

In this regard anaerobic digestion of organic waste for biogas production emerges as the best option (Sunarso *et al.*, 2012) which also in line with the United Nation Framework Convention on Climatic Change (UNFCCC) and the Kyoto protocol

Research studies conducted so far to increase the quantity of biogas produced from biomass are many, with results revealing that the rate at which biogas is produced is influenced by several factors. These factors includes; nature of the substrate, Carbon to nitrogen ratio, reaction temperature, reaction pH, agitation etc. (Bogudo *et al.*, 2011). However, studies that establishes maximum biogas yield in conjunction with improved biogas quality are few. Thus, the present research examines the effect methanogenic bacteria type on yield and quality of biogas from agricultural wastes.

Materials and methods

Collection of samples

Palm oil mill effluent (POME) was obtained from the Nigeria Institute for oil Palm Research (NIFOR) and rubber processing effluents (RPE) was obtained from Okomu. The wastewaters were collected from the discharge unit of their sewage systems in pre sterilized jerry cans. The anaerobic slurries that were used for the microorganism isolation and characterization were obtained from an existing anaerobic digestion plants, namely: Guinness PLC, Okomu Oil Mill and Presco Oil Palm. The cow droppings was obtained from a slaughter house in Oluku. All samples were collected in Benin City, Edo State in triplicates from each source in pre-sterilized bottles and stored in a refrigerator at 4°C before use.

Analysis of the effluents

The effluents were analyzed for their physiochemical properties before and after anaerobic digestion using standard methods (APHA, 1999);

Preparation of the cow dung slurry

Fresh cow dung was mix thoroughly with distilled water in a ratio of 1:2 (10 Kg cow dung: 20 litre water).The slurry was filtered and allowed to pre-decay for three days to ensure bacteria multiplication.

Isolation and characterization of microorganisms

The standard dilution plate method was used for recovery of bacteria in nutrient agar (NA) (Kamil *et al.*, 2007) from the anaerobic slurries samples. Isolation and population of colony forming units (Cfu ml⁻¹) was evaluated by the 10-fold serial dilution method (Sylvia *et al.*, 2013). Four-fold (10⁻⁴) serial dilutions were placed on the different media and incubated at room temperature. Observations and counting for bacteria colonies were carried out at 24 to 48 h after inoculation. Primary isolation of bacteria was effected by streaking sample on the surface of a NA plate and then incubated at 28 ± 2°C for 72 h. Single colonies from these plates were sub-cultured for purification (Amna and Gfozia, 2012; Saraswati *et al.*, 2012).

The pure isolates of bacteria cultures were maintained on NA. Bacterial isolates were inoculated on nutrient broth and incubated for 7 days at 28 ± 2°C before use.

Identification of bacteria

Identification of bacterial species was done by recording macroscopic and microscopic characters. The purified colonies were subjected to Gram staining and characterized using biochemical tests by Bergey's Manual of Determinative bacteriology (Holt *et al.*, 1994).

Inoculated anaerobic digestion of samples

Samples of palm oil mill effluent (POME) and rubber processing effluent (RPE) were treated separately with inoculum at varying effluent to inoculum (E:I) ratios in a closed anaerobic digester at the same organic loading rates (OLR), using the mesophilic techniques (Vavilin *et al.*, 2008). The experiment consisted of three batches, with each batch consisting of fourteen feeding treatments. The treatments at varying effluent to inoculum ratios (E:I), respectively, for RPE and POME are shown in Table 1

Table 1: Varying effluent to inoculum ratios (E:I)

Serial no	1	2	3	4	5	6	7
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Effluent: Inoculum ratio	5:0	4:1	3:2	1:1	2:3	1:4	0:5
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Plate 1: Laboratory Scale Setup of Biogas Production

Semi-pilot scale inoculated biogas production from best performance effluent to inoculum ratios

Slurries of a mixture of 1:1 of POME and 3:2 RPE to cow dung, bacteria A and bacteria B (inoculum), respectively, were fed into the digester. A biogas outlet pipe connected tightly to a balloon served as the biogas receiver (Plate 2).



Plate 2: Setup of Biogas Production

Combustion test and compositional analysis of biogas

The combustion test was carried out according to the method previously used by Mokobia *et al.*, (2012). The gas evolved was captured and analysed for its components (CH₄, CO₂, and H₂S) using a biogas analyser (Geotech5000) (Plate 3).



Plate 3: Set Up Of Biogas Analyser Analysing the Synthesized Biogas

Statistical analysis

One way analysis of variance (ANOVA) was used to assess the significant differences in the data obtained. The mean of the data was compared using SPSS (Statistical package for Social Scientist).

Results and discussions

The physiochemical properties of the palm oil mill effluent (POME) under study (Table 2) showed that the pH value was in the acidic region (4.50) and not within the regulatory discharge limits for wastewaters. The low pH values for POMEs are consistent with many research findings; Osaigbovo and Orhue, (2011) reported pH value of 4.8 for POME. Ma (2000); Ahmed *et al.* (2003) reported pH value of 4.7. Also pH values as low as 3.8 was also reported (Abdurrahman, *et al.*, 2011). Rupani *et al.*, (2010); Bala *et al.*, (2014) reported that low pH of POMEs that ranged between 4 – 5 is usually due to the organic acid produced in the fermentation stage during palm oil processing. The temperature was also very high (86°C) and not within the regulatory standard for effluent discharge to the environment.

Other physiochemical properties of POME were not within the regulatory standard for effluent discharge (Ma, 2000; Ahmed *et al.* 2003). The suspended solid (18, 178 mg/l) was higher than the 400 mg/l of the regulatory standard. The COD of the effluents were also very high suggesting that they have high pollution potential when discharged into the environment without proper treatment. Abdurrahman, (2011) stated that high COD for POME could be as a result of residual oil on the fruits after extraction.

On the other hand, the rubber processing effluent under study had pH value of 6.60 suggesting that the effluent is slightly acidic and within the regulatory discharge limits for effluent (Ma, 2000; Ahmed, 2003). Acidic pH values are consistent with some previous studies on RPE. Pillai and Girish (2014) reported a pH value of 5.7. Also a pH value of 5.0 was reported by Orhue and Osaigbovo (2013). Rungruang and Babel, 2008; Tekasakul and Tekasakul, (2006) had pH value range of between 3.7 -5.5. However, Asia and Akpohonor (2007) had a contrary value of 8.1. Rubber processing effluent is characterized by a highly fluctuating pH (Pillai and Girish, 2014; Muhammadi *et al.*, 2010). The total solids (TS), total suspended solids (SS) and COD for RPE was lower than that of POME. The most likely reason for this is because the latex exuded by a rubber tree has about 60 percent water (Asia and Akpohonor, 2007). COD values for the RPE was higher than results obtained by Asia and Akpohonor (2007) (3142 mg/l) but consistent with Orhue and Osaigbovo (2013).

Table 2: Characteristics of the Palm Oil Effluent (POME) and Rubber Processing Effluent (RPE)

PROPERTIES	NIFOR POME	OKOMU RPE	REGULATORY DISCHARGE LIMIT(Ma, 2000; Ahmed <i>et al.</i> , 2003)
TEMPERATURE °C	86	35	45

pH	4.50	6.60	5.0 -9.0
COD	59,814.81	1801.74	-
CONDUCTIVITY (S/m)	15805.66	414.46	-
TOTAL SOLIDS	48,000	1,450	-
SUSPENDED SOLID	18,178	668	400
DISSOLVED SOLIDS	29,822	782	-
VOLITILE SOLIDS	42,000	143	-
OIL & GREASE	4,200	8.9	50

All values, except conductivity, pH and temperature are expressed in mg/l.

BACTERIA PRESENT IN THE THREE ANAEROBIC SLURRY SAMPLES

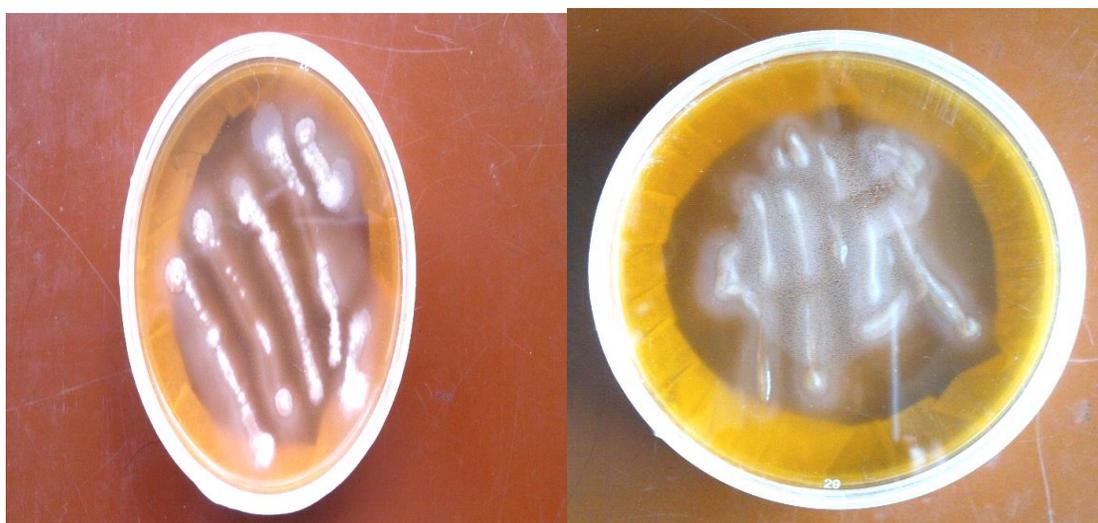


PLATE 1: Bacteria present in the three effluents -A, *Coccus spp.* and B, *Bacillus spp*

Table 3 shows the morphological characteristics of the bacteria present in the three anaerobic slurries samples. The Coccus type was Gram positive with smooth surface, filamentous in shape and edge. It was cream in colour on the agar plate. The Bacillus type was Gram negative with irregular shape, raised elevation, undulating edge, rough surface and white colour on the agar plate.

Table 3: Morphological Characteristics of the Bacteria

MORPHOLOGY (FROM AGAR PLATES)								
	Shape	Elevation	Edge	Colour	Surface	Cell	Shape	Gram stain
1	Filamentous	Raised	Filamentous	Cream	Smooth	Coccus		+
2	Irregular	Raised	Undulating	White	Rough	Rod		-

Table 4: Bacteria Population (Cfu/ml) of the Anaerobic Slurry Samples

Anaerobic slurry	Colony forming unit/ml (Bacteria)
------------------	-----------------------------------

Guinness	1.83 x 10 ^{8a}
NIFOR	1.86 x 10 ^{8a}
Presco	2.02 x 10 ^{8b}

Means with different alphabet remarks are significantly different at (P<0.05).

Table 4 shows the bacteria population (Cfu/ml) of the three anaerobic slurry samples. Effluent from Presco had the highest bacteria count (Cfu/ml) with values significantly different (P<0.05) from Guinness and NIFOR effluents. Guinness recorded the least Cfu/ml and its value was not significantly different (P<0.05) from the NIFOR effluent.

Table 5: Highest biogas yield from the inoculated POME and RPE

Effluent Samples	Highest biogas yield (cm ³)	Effluent to Inoculum ratio (E:I)
Cow dung inoculated POME	465.00 ± 47.097	1:1
Bacteria A inoculated POME	1610.00	1:1
Bacteria B inoculated POME	940.00	1:1
Cow dung inoculated RPE	690 ± 55.272	1:1
Bacteria A inoculated RPE	1985.00	3:2
Bacteria B inoculated RPE	1195.00	3:2

Means with different alphabet remarks are significantly different at (P<0.05).

Table 5 shows biogas yield from the inoculated POME and RPE. From the result, it is observed that RPE yielded more biogas in all the trials as compared to POME. The most likely reason for this could be because of the higher pH value (6.60) of the rubber processing effluents, providing an enabling environment for the bacteria to thrive.

pH is an important factor in the anaerobic digestion of biomass. The importance lies on the fact that methanogenic microorganisms are very sensitive to changes in pH. Their growth and methane production are inhibited when the pH is not within 6.5 – 7.5 (Zupancic and Griliz, 2012). Ezekoye (2013) reported that both acid and methane formation bacteria cannot survive at pH values below 4 and above 10. Many cases of process failure are caused by the accumulation of volatile fatty acid concentration, leading to a drop in pH and subsequently inhibit methanogenesis (Parawira *et al.*, 2006; Patel and Madawar, 2000).

TOTAL BIOGAS YIELD FROM COW DUNG INOCULATED NIFOR POME AT VARYING SUBSTRATE TO INOCULUM RATIOS

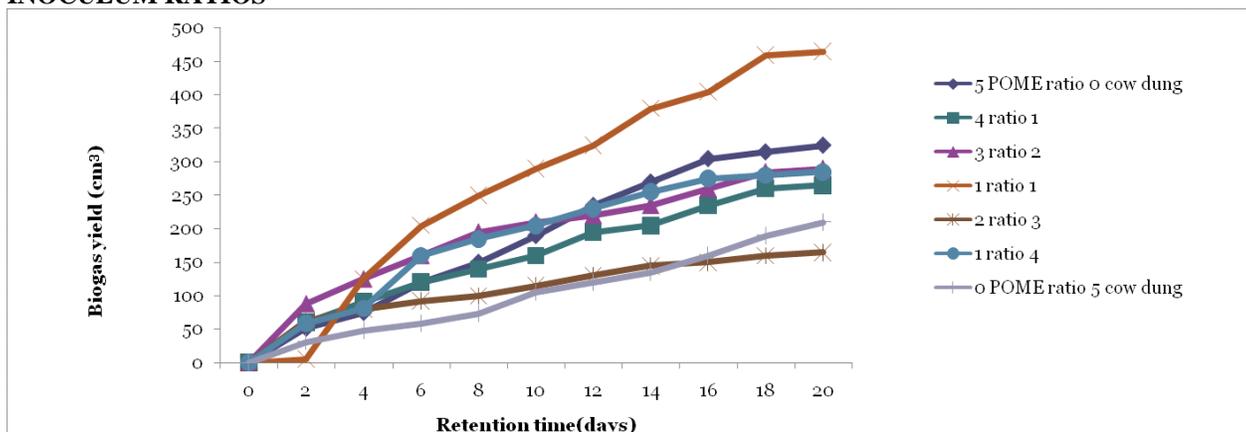


Figure 2: Total Biogas Yield from Cow Dung Inoculated NIFOR POME at Varying Substrate to Inoculum Ratios

TOTAL BIOGAS YIELD FROM COW DUNG INOCULATED OKOMU RPE IN SEVERAL DAYS RETENTION TIME AT VARYING SUBSTRATE TO INOCULUM RATIOS

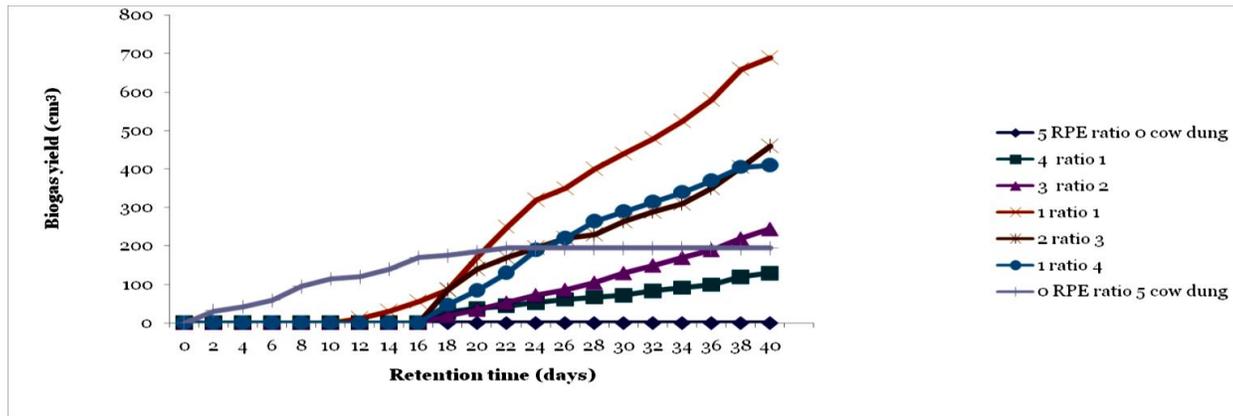


Figure 3: Total Biogas Yield from Cow Dung Inoculated OKOMU RPE at Varying Substrate to Inoculum Ratios

Figure 2 shows biogas yield from NIFOR POME at varying effluent to inoculums ratio. From the graph it was observed that the best performance effluent to inoculums ratio was the 1:1 (E: I) with a total biogas yield of 465cm³ at 20 days retention time.

Figure 3 show the biogas yield from Okomu RPE. From the graph, it is observed that the highest biogas yield was 690 cm³ which was attained at 40 days retention time,(E:I) ratio of 1:1. This yield was higher than for POME. The most likely reason for the high biogas yield from RPE could be because of the high pH value (6.60) of the rubber processing effluents, providing an enabling environment for the bacteria to thrive. The methanogenes proliferate at pH range of between 6.5 –7.5 and their activities outside these values could result to system failure (Zupancic and Grilc, 2012). Low pH inhibits the activities, growth and population of the methanogenes. It also leads to acid accumulation since the methanogenes are responsible for the consumption of the acid formed. The final effect is low methane generation and system failure.

Also, higher biogas yield from inoculated effluents as compared to the raw effluent is consistent with literature (Ezeonu *et al.*, 2002; Aigbodion *et al.*, 2014; Uzodinma *et al.*, 2007). Biogas production increases with increasing quantity of inoculums (Forster-Camero *et al.*, 2008), feed to inoculum ratio influence biogas production rate (Sunarso *et al.*, 2012; Liu, *et al.*, 2009); and inoculum content influences the performance of anaerobic reactor (Budiyono *et al.*, 2009). Also, organic waste can be blended to improve biogas quantity and quality through synergistic effect (Uzodinma *et al.*, 2007; Ofoefule and Uzodinma, 2006). Biogas yield of over 400% increase was recorded from blending brewery spent grain with poultry dropping at a ratio of 4:1. (Ezeonu *et al.*, 2002).

BIOGAS YIELD FROM BACTERIA A INOCULATED NIFOR POME IN AT VARYING SUBSTRATE TO INOCULUM RATIOS

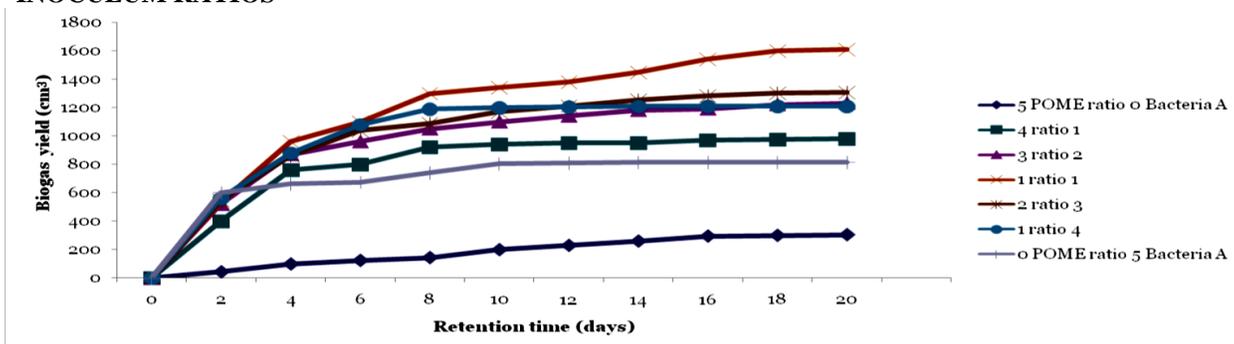


Figure 4: Total Biogas Yield from Bacteria A Inoculated NIFOR POME at Varying Substrate to Inoculum Ratios

TOTAL BIOGAS YIELD FROM BACTERIA B INOCULATED NIFOR POME IN TIME AT VARYING SUBSTRATE TO INOCULUM RATIOS

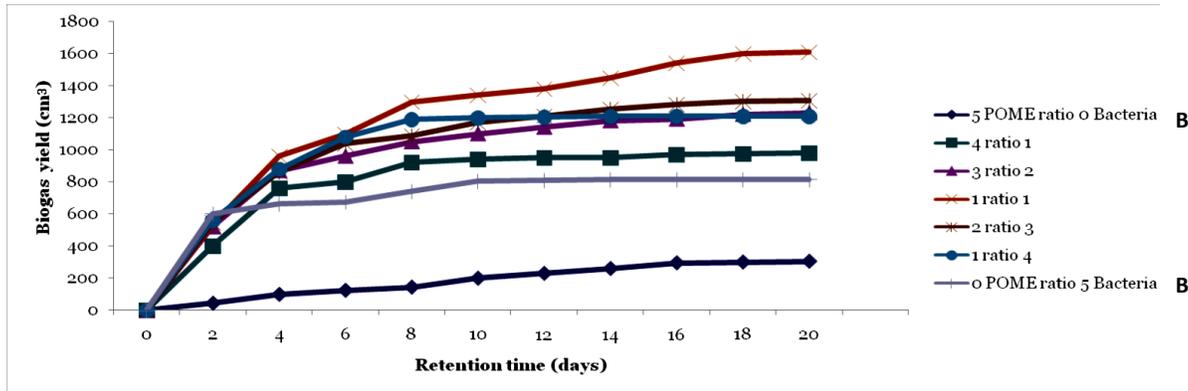


Figure 5: Total Biogas Yield from Bacteria B Inoculated NIFOR POME at Varying Substrate to Inoculum Ratios

Figure 4 shows the biogas yield from bacteria A inoculated NIFOR POME. From the graphs, it is observed that the best performance E:I ratio is 1:1, which gave the highest biogas yield of 1610cm³ over the same retention time of 20 days. These results suggest that anaerobic digestion of pure culture bacteria inoculated POME does not reduce retention time. However, biogas yield was significantly increased (about six - times) as compared to raw POME.

Figure 5 shows the biogas yield from bacteria B inoculated NIFOR POME. From the graph, it is observed that the best performance E:I ratio is also 1:1, with the highest biogas yield of 940cm³ over the same retention time of twenty days. The highest biogas yield from this experiment was lower than the one obtained from bacteria A, suggesting that bacteria A is more able to decompose the effluent, thus yielding more biogas in return.

TOTAL BIOGAS YIELD FROM BACTERIA A INOCULATED OKOMU RPE AT VARYING SUBSTRATE TO INOCULUM RATIOS

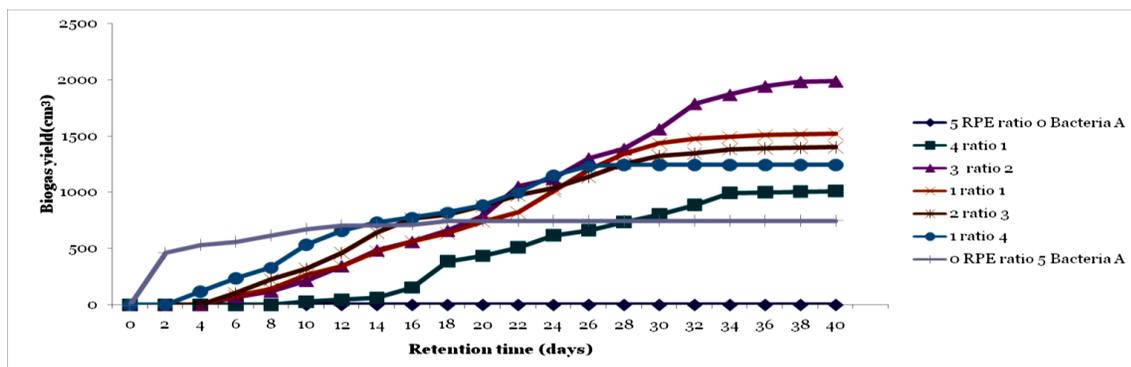


Figure 6: Total Biogas Yield from Bacteria A Inoculated Okomu RPE at Varying Substrate to Inoculum Ratios

TOTAL BIOGAS YIELD FROM BACTERIA B INOCULATED OKOMU RPE AT VARYING SUBSTRATE TO INOCULUM RATIO

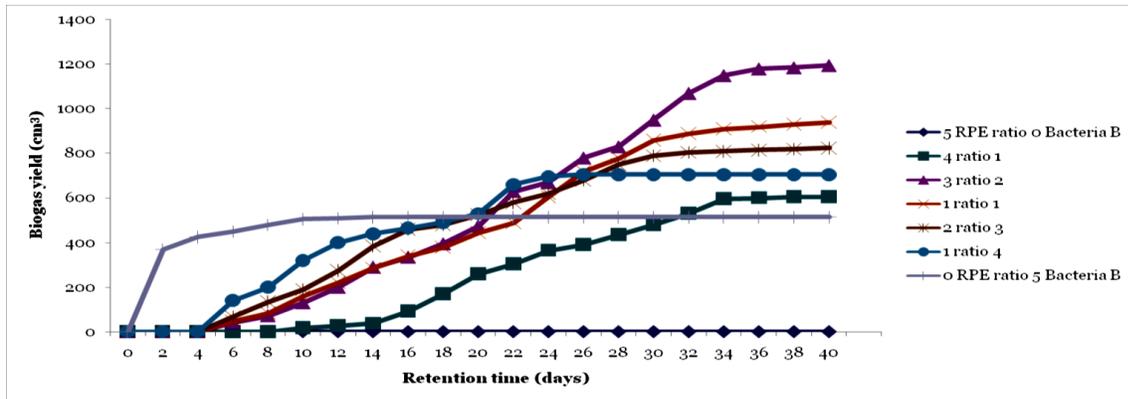


Figure 7 Total Biogas Yield from Bacteria B Inoculated Okomu RPE at Varying Substrate to Inoculum Ratio

Figure 6 shows the biogas yield from bacteria A inoculated Okomu RPE. From the graph, it is observed that the best performance E: I ratio is 3:2. This ratio gave the highest biogas yield of 1985cm³ over the same retention time of forty (40) days. The biogas yield from bacteria A inoculated Okomu RPE is higher than the bacteria A inoculated NIFOR POME in spite of its high COD level. It is likely that the high pH of RPE provided an enabling environment for the bacteria to thrive which translated to a higher biogas yield.

Figure 7 shows the biogas yield from bacteria B inoculated Okomu RPE. From the graph, it is observed that the best performance E:I ratio is also 3:2 with a yield of 1195cm³. The reduced yield of biogas in this experiment as compared to the bacteria A inoculation further confirms that bacteria A has a higher substrates degradation efficiency.

BIOGAS COMBUSTION TEST

There was a pop sound when a lit match was brought close to the mouth of the measuring cylinder, while the cover was partially removed. However, on controlled release of biogas, it burned with a blue flame.

Table 6: Compositional Analysis of Biogas

EFFLUENT: INOCULUM	TOTAL BIOGAS YIELD (Cm ³)	METHANE (CH ₄)		CARBON (IV) OXIDE (CO ₂)		HYDROGEN SULPHIDE (H ₂ S)		OXYGEN (O ₂)		TRACES OF OTHER GASES	
		(Cm ³)	(%)	(Cm ³)	(%)	(Cm ³)	(ppm)	(Cm ³)	(%)	(Cm ³)	(%)
NIFOR POME: Cow Dung	465	262.12	56.37	181.86	39.11	≈	448	-	-	20.97	4.51
NIFOR POME: Inoculum A	1,610	1,115.57	69.29	436.63	27.12	≈	246	2.09	0.13	55.54	3.45
NIFOR POME : Inoculum B	940	639.01	67.98	278.80	29.66	≈	174	-	-	22.09	2.35
Okomu RPE: Cow Dung	690	358.11	51.90	264.96	38.40	≈	612	1.38	0.20	64.86	9.4
Okomu RPE: Inoculum A	1,985	1,345.61	67.96	561.56	28.29	≈	273	-	-	74.24	3.74
Okomu RPE: Inoculum B	1,195	790.37	66.14	380.85	31.87	≈	125	-	-	23.66	1.98

Table 6 shows the compositional analysis of the biogas from NIFOR POME and Okomu RPE using the different inoculums. The results shows that the NIFOR POME inoculated with bacteria A (Coci spp) had the highest methane content. However, the Okomu RPE had the highest biogas yield. It was also observed that samples of POME and RPE both inoculated with cow dung had the lowest biogas yield, lowest methane content and highest carbon dioxide yields. This may perhaps be as a result of the fact that the bacteria inoculated effluents were pure culture and were more able to anaerobically degrade the substrates thus producing highest methane

concentration and lowest carbon IV oxide content. The biogas yield from rubber processing effluents could be attributed to its high pH which creates enabling environment for the bacteria to thrive. Also, previous study had shown that low pH (acidic) accounts for low volume of biogas (Uzodinma *et al.*, 2007). Also, comparing biogas yield and quality of the different inoculums in a particular effluent, it was observed that higher biogas yield and better quality was obtained with bacteria A (Coci spp).

Conclusion and recommendation

Inoculation led to a significant (about 6-fold and above) increase in the yield of biogas from anaerobic digestion of POME and RPE. Inoculation also enhanced the quality of the biogas generated. RPE had the highest biogas yield compared to POME. The coci spp. gave higher biogas yield and better biogas quality as compared to the bacillus spp. Anaerobic digestion of raw uninoculated RPE did not generate biogas. The best performance effluent to inoculums (E: I) ratio for both effluent was 1:1 Further investigation more blending ratios with the same or different effluents and inoculums to achieve higher biogas yield of better quality is recommended.

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Mapping the Potential for Social Enterprises in Coastal Areas

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Abstract- This research was conducted in order to obtain the best innovation strategy for Village-Owned Enterprises (BUMDES) to improve the economic welfare of the coastal communities of Sukasari, Lawang Agung and Kunkai Baru, Seluma Regency. Mapping analysis of potentials and problems that occur in BUMDES in coastal areas is done by using the Focus Group Discussion (FGD) method through SWOT analysis techniques and Criterium Plus - Analytical Hierarchy Process analysis. The results of the study show that there are 4 priority problems that occur in existing BUMDES, namely the problem of weak financial governance, weak BUMDES management, limited marketing access, and the similarity of the BUMDES business field to other BUMDES. Problem solving strategies can be carried out through efforts to build marketing networks, business feasibility studies through BUMDES health checks and build synergies with local governments.

Index Terms- Strategy; Bumdes; Welfare; Coastal Society

I. INTRODUCTION

In the Village Law, BUMDesa defined as a business entity whose entire or most of the capital is owned by the Village through direct participation from village assets that are separated to manage assets, services, and other businesses for the maximum welfare of the village community. In its development, the Village-Owned Enterprises (BUMDes) in encouraging the protection of the community through the business units they built, are still far from expectations (Purnamasari, 2017). The factors that influence it include: Understanding the village apparatus about BUMDES is very lacking, the concept of village development is still limited to understanding physical development and on the direction of the structure from above. Weak human resource development so that village institutional and entrepreneurial capacity is not developing. Communication between the village elite and community members regarding various issues has not been going well.

Other factors include corrupt behavior, making the spirit of creating social change for the community become sluggish, and even mimic those actions. Evidently there are hundreds of village heads who are currently facing court because they are suspected of misusing village funds for their own interests. Many government programs before BUMDes such as KUD, BUUD and various other programs failed. Some villagers thought that they did not have to return the funds that should have been

capital for village businesses run by BUMDes. Inadequate mastery of managerial skills, and it is still difficult to convince young people that BUMDes can guarantee prosperity for its activists. Conditions that make young people have not been much active in BUMDes, resulting in the business logic built by most BUMDes implemented with conventional models and not many innovations have been carried out by BUMDes.

The continuous campaign that creates the image that BUMDes must generate substantial profits in the form of benefit (rupiah) is evident from the measure of BUMDes success, which often measured from the profits deposited into the village treasury. This perspective makes the village heads and village officials add a heavy burden because they have to create business units with significant turnover and profit for the village. On the other hand the issue of economic welfare, especially in coastal areas still needs to be a concern of the government. Common problems faced by coastal communities include poverty levels (economic uncertainty), damage to coastal resources, and environmental health, as well as the use of marine areas for fishermen (Firdaus, 2017).

Some things that become fundamental problems for BUMDes, in general, are the limited human resources in managing the business units contained on BUMDes itself. The lack of innovation in managing Production for BUMDes whose business units in the field of Production and tourism make its problems. The products produced by BUMDes have not been able to compete with factory-made Production, and the ability to explore the economic potential of the village and business planning is still lacking.

Inside Seluma Regency, Bengkulu Province, a total of 177 BUMDes stood out of a total of 182 villages, with 145 BUMDes said to be active (DPMD Bengkulu Province, 2019). Of these, the average BUMDes position is still in the pilot BUMDes cluster position. Characteristics of start-up BUMDes marked by traditional management systems, limited human resources, and inadequate marketing. Sukasari, Kungkai Baru and Lawang Agung villages are part of the Air Periukan sub-district, Seluma Regency, Bengkulu Province (map of Seluma district, 2017). These three villages located in coastal areas directly adjacent to the Indian Ocean. As a coastal region, these villages have potential coastal resources, including agricultural and plantation products such as oil palm, corn, and coconut, as well as livestock products such as fish ponds and cattle, and marine products such as fish, shrimp, and fish ponds. With this potential, supported by the existing BUMDes it should be able to improve the welfare of

the people in the coastal region. Necessary study in mapping the BUMDes problem so that the right problem solving obtained. This study aims to examine the efforts made by BUMDes to improve the potential and economic prosperity in the coastal area of Air Periukan District. The output of this research is to find the right innovation strategy and hope that the one village one product program can be realized based on the potential and available resources.

II. MATERIALS AND METHODS

1. Village-Owned Enterprises (BUMDES)

BUMDes is a business entity determined through a Village Regulation based on the results of a Village Deliberation decision, based on a Village Regulation. It does not require endorsement from a Notarial Deed. However, based on Article 7 of Law Number 6 of 2014 concerning Villages, BUM Desa can consist of business units with legal entities such as Limited Liability Companies (PT) and Micro Finance Institutions (LKM). The legal basis of BUMDes consists of:

- a). Law Number 6 of 2014 concerning Villages;
- b). Government Regulation No. 43 of 2014 concerning Regulations for Implementing Law Number 6 of 2014 regarding Villages;
- c). Government Regulation Number 47 of 2015 concerning Amendment to Regulations for Implementation of Law number 6 of 2014 concerning Villages;
- d). Regulation of the Minister of Villages, Development of Underdeveloped Regions, and Transmigration No. 4 of 2015 concerning the Establishment, Management and Management, and Dissolution of Village-Owned Enterprises.

The objectives of BUMDes include raising the village economy, optimizing village assets to benefit the welfare of the village, increasing community efforts in managing the economic potential of the town opening employment, improving community welfare through improving public services, growth, and equitable distribution of the village economy; and increase the income of the village community and the village's original salary. Village Capital Participation, consisting of grants from private parties, social and economic institutions and/or donor agencies, Government assistance through the Village APB mechanism, Village assets submitted to the Village APB following the provisions of the legislation on Village Assets.

2. Strategy

The strategy is the overall approach related to the implementation of ideas, planning, and execution of activity within a specified period. In a good plan, there is coordination of the work team, has a theme, identifies supporting factors that are following the principles of implementing ideas rationally, is efficient in funding, and has tactics to achieve goals effectively (Porter, 2008).

3. Innovation

According to Law No. 18 of 2002, innovation is a research, development, and or engineering activity carried out intending to

develop a practical application of the values and context of new knowledge or even new ways to apply existing science and technology to products or processes its production.

Innovation strategy is related to the Company's strategy response in adopting innovation. In previous studies, various types of innovation strategy typologies have used.

Based on Freeman (1978) in Hadjimanolis & Dickson (2000), who proposed six classification typologies of innovation strategies, namely: offensive innovation strategy, defensive, imitative (like to imitate), dependent, traditional, and opportunist strategy. This classification based on the speed and time of entry from the Company into new technology areas.

Urban & Hauser (1980) in Hadjimanolis & Dickson (2000) distinguish the typology of innovation strategies from proactive strategies, where the company tries to predict and anticipate changes in the environment. This type is usually the first company to innovate (first movers). Its advantages are building market share and reputation for innovation. Still, it has weaknesses because it has to pay high development costs and the risk of investment in technology or design that is wrong. The reactive strategy is a company that only reacts to consumer demand and competitor activity, and tends to adopt other companies' innovation processes (Rogers, 1983).

4. Potential Economic Welfare

Prosperity in economics is a branch of economics that uses microeconomic techniques to determine the efficiency of allocations from macroeconomics and the consequence of interrelated income distribution (Lincoln Arsyad in Djamaludin, 2012) simultaneously. According to the Coordinating Ministry for People's Welfare, the meaning of prosperity is a condition of society that has met its basic needs. These basic needs include the adequacy and quality of food, clothing, shelter, health, education, employment, and other requirements such as a clean, safe, and comfortable environment. Economic indicators that are widely used by international institutions include income per capita (GNP or GDP) and the amount of savings, while signs of economic growth are the structure of the economy and the level of urbanization.

5. Coastal Society

Coastal communities, or known as foreign languages Coastal Community, is a society that has the main characteristics that do not produce goods and services economically. According to Soegiarto in Dahuri (2012), coastal communities are people who live in coastal areas with their lives in the marine ecosystem.

Research Road Map

By identifying the problems faced by BUMDes in the coastal areas of the Seluma Regency, it hoped that what will become the fundamental problems as well as the potential that can develop. With SWOT analysis techniques, it will be more specific to know what are the strengths, weaknesses, opportunities, and threats, through the calculation of IFAS (Internal Factor Analysis Strategy) and EFAS (External Factor Analysis Strategy). The next step of decision-making techniques using the Analytical Hierarchy Process - AHP.

The following research road map that will be carried out to create an independent, productive BUMDes, has a competitive advantage and can maximize the potential in the Seluma district coastal area, by developing innovative BUMDes, so that economic prosperity is:

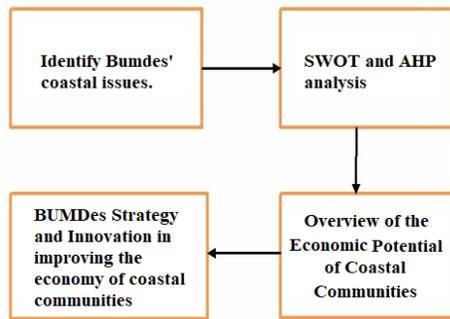


Figure 1. Research Road Map

Research Location and Time

This research will be carried out in three villages in the coastal area of Air Periukan Subdistrict, Seluma Regency, Bengkulu Province, including Sukasari, Kunkai Baru, and Lawang Agung. The study was conducted for four months, starting from observation, field visits, and the FGD process to data processing.

Data Types and Sources

The data used in this study are primary data obtained by conducting FGD (Focus Group Discussion) and direct observation of BUMDes and community activities. Secondary data collected through literature, ministerial decrees, as well as data from the Central Bureau of Statistics (BPS), as well as research related to strategy, innovation, and BUMDes.

Method of collecting data

Data collection techniques in this study used purposive sampling through FGD patterns with BUMDes management, Village Heads, and community leaders, fishers, farmers/traders. FGDs are conducted readily to enable other community members to attend. Accidental sampling did by conducting interviews and direct observation of BUMDes and village communities. The selection of research sites based on the resource potential and socioeconomic conditions of the neighborhood (Sekaran, 2011).

Data analysis method

Data analysis methods used are descriptive analysis, SWOT analysis (Strength, Weakness, Opportunity, Threat) and Criterium Plus - Analytica Hierarchy Process. The SWOT analysis was carried out to get a picture of the problems with BUMDes in the coastal areas of the Air Periukan sub-district, Seluma Regency. David (2015) states that SWOT is an essential tool for developing four types of strategies: 1). Strength-Opportunity Strategy, 2). Weakness Strategy - Opportunities, 3). Weakness Strategy - Threats, 4). Strength Strategy - Threats. Marimin in Firdaus (2016), there are three stages in conducting a

SWOT analysis, namely, taking data by conducting external and internal evaluations. The second is an external, internal matrix, and a SWOT matrix, the third stage of decision making. The steps of the SWOT analysis are in Table 1.

By using AHP, a problem will be solved in an organized frame of mind, so that it can be expressed to make effective decisions on the problem. Complex issues can be simplified and accelerated the decision-making process (Saaty in Marimin, 2011).

After conducting the SWOT analysis process and obtaining input from categorized problems that were responded by respondents in the FGD activities, the question then weighted in AHP analysis in each coastal village in Air Periukan District.

Table 1. Explanation in SWOT Matrix Analysis (Radiarta, 2015)

Category	Strength Identification of Internal Strength Factors	Weakness Identification of Internal Weakness Factors
Opportunities Identification of External Opportunities Factors	SO Strategy Formulate strategies that use power to take advantage of opportunities	WO Strategy Formulate strategies that minimize weaknesses to exploit strengths
Threats Identification of External Threat Factors	ST Strategy Strategy formulation that uses power to overcome threats	WT Strategy Formulate strategies that minimize weaknesses and avoid threats

AHP is carrying out after the SWOT analysis is complete, to illustrate the priority of the problem based on general categories and occurs in each village. The values and definitions of qualitative opinions from the comparison scale Saaty (1983) present in Table 2.

Table 2. Value and definition of qualitative opinions from the comparison scale Saaty (1983)

Score	Explanation
1	The vertical factor is as important as the horizontal factor
3	The vertical factor is more important than horizontal factor
5	The vertical factor is clearly more important than the horizontal factor
7	The vertical factor is clearly more important with the horizontal factor
9	The vertical factor is absolutely more important than the horizontal factor
2, 4, 6, 8	When in doubt between two values of adjacent elements
1 / (2-9)	Opposite of captions 2-9

The following is a flow chart of a study of the conditions of the Bumdes in the coastal area.

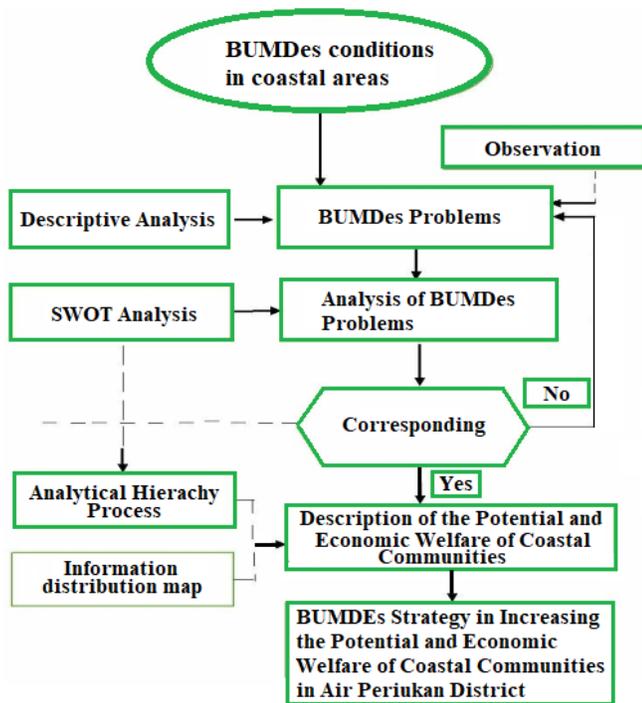


Figure 2. flow chart of a study of the conditions of the Bumdes in the coastal area

III. FINDINGS AND DISCUSSIONS

A. Findings

1. General Conditions of Lawang Agung Village, Sukasari Village and Kungkai Baru Village

Lawang Agung Village is the path that goes to Sukasari Village and Kungkai Baru Village if we are from the direction of the capital city of the Seluma Regency. The majority of the population in the village of Lawang Agung are the indigenous people of the Serawai ethnic group, while for the town of Sukasari and Kungkai Agung, they were transmigration areas in 1970, so many of them were Javanese and Balinese.

BUMDES Lawang Agung's superior products include papaya dodol, managing village Pamsimas, while for Sukasari village, it includes Red Ginger juice drink products, Dishwashing Soap and Lemongrass Oil, managing village markets and savings and loan activities. For the Village of Kungkai Baru, the BUMDES line of business includes renting a shophouse and maintaining the beach as a tourist area. But this is still a problem because, according to BKSDA, the beach is a protected forest area, but the community hopes that BUMDES can manage the forest as a tourist forest area. This issue is still in the process of reducing the status of the protected forest area to TWA so that the community /BUMDES can manage it.

2. Strategy for solving the BUMDes problem in the Seluma Regency Coastal region

Problem-solving strategies are solved using SWOT analysis tools. The Internal Factors Analysis Summary (IFAS) using a matrix model to describe the strengths and weaknesses of the internal conditions of the Banda Neira community, while to describe the opportunities and threats of the external terms of the Banda Neira community using the External Factors Analysis

Summary (EFAS) matrix. IFAS and EFAS matrix model assessments are obtained based on the weight given by respondents to the conditions and problems and analyzed according to the SWOT analysis criteria, namely strengths, weaknesses, opportunities, and threats. The weighted results present in the form of IFAS and EFAS matrix models. The results of the internal factor assessment (IFAS) describe in Table 3 below.

Table 3. Internal Factors of BUMDes Condition in Coastal Areas of Seluma Regency

Internal Factor	Weight	Rating	Score
Strength			
Community Participation in BUMDes	0.125	7	0.875
Human Resources Managers BUMDes	0.120	7	0.840
Support from the village government and related stakeholders	0.085	6	0.510
Village and beach markets	0.080	6	0.480
Cultural customs / traditions of the community	0.090	6	0.540
Total Strength			3,245
Weakness			
BUMDes Product Marketing	0,12	3	0,36
Information technology facilities	0,11	2	0,22
Availability of Raw Materials	0,09	3	0,27
Inadequate Education and Training	0,09	2	0,18
Transportation facilities in the Coastal region are inadequate.	0,08	2	0,16
Total Weakness			1,19
Total Internal Factor			4,435

Source : Data processing results, 2019

Based on the analysis of internal factors (IFAS), the total value of internal factors is 4.435.

The main strength with the highest value is community participation of 0.875 with a total strength value of 3.245, while the main weakness with the highest value is the means of transportation to the coastal areas of the district with a total value of weakness of 0.80.

The value of these internal factors strengthened by the close relations between the communities in the villages of Lawang Agung, Sukasari, and Kungkai Baru. The surgical pattern of Muara Kungkai, whose fish can be enjoyed by all villagers, is an annual tradition of the residents of the new Kungkai Village and its surroundings, with the dominance of customs originating from the transmigration of the Javanese community is still so thick.

The results of the analysis of internal factors are taken into consideration in the preparation of strategies for solving the BUMDes problem in the Seluma Regency Coastal area. Besides IFAS, an external factor approach (EFAS) is also needed.

EFAS's assessment of BUMDes in Pesisir village, Seluma district is presented in Table 4 below.

Table 4. External Factors of BUMDes Condition in Coastal Areas of Seluma Regency

External Factor	Weight	Rating	Score
Opportunities			
Alternative livelihoods	0.075	6	0.450
Potential coastal and agricultural resources	0.125	7	0.875
Central/Regional Government Policy	0.100	7	0.700
Community Empowerment	0.115	7	0.805
Potential tourist and cultural areas	0.090	6	0.540
Total Opportunities			3,370
Threats			
BUMDes products have not been able to compete.	0,111	2	0,222
The same business unit as other BUMDes	0,115	2	0,230
Issues of regional forests and abrasion	0,112	2	0,224
BUMDes Management and Governance	0,073	3	0,219
Utilization of tourist areas is not optimal	0,085	3	0,255
Total Threats			1,114
Total External Factor			4,518

Source : Data processing results, 2019

Based on the analysis of external factors (EFAS), the total value of external factors is 4.518. This value indicates that the environmental conditions of the coastal areas of the Seluma district can provide positive responses; opportunities can utilize to minimize existing threats. The main opportunities with the highest value are the potential of coastal and agricultural resources by 0.875 with a total opportunity value of 3.37, while the main threat with the highest value is that BUMDes products have not been able to compete by 0.22 with a total threat value of 1.148.

The condition of coastal and marine resources is still good, and agricultural potential is an opportunity for the Seluma Regency coastal communities to be developed in improving the welfare of the community through BUMDes. Also, the possibility of a white sand beach area and Cemara Plant, commonly called Cemoro Sewu, can be developed into a tourist area managed by the BUMDes so that it will support the community's economy. Plantation and horticultural areas (lemongrass) are also a potential opportunity for the Seluma Coastal community to improve the economy. The activities of local people and tourists who come to the villages of Lawang Agung, Sukasari, and Kungkai Baru in Seluma Regency, and the distance is quite close to the Regency and Province Cities, if supported by excellent transportation will help increase community income through BUMDes.

Some alternative strategies that can be developed in the management of coastal and marine areas by BUMDes include the

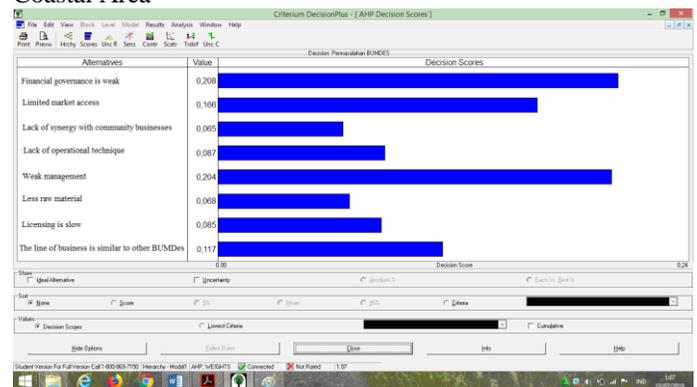
use of waters in the National Park area that must aim at supporting the function of the city while increasing community welfare.

The resolution of the BUMDes problem in the Seluma Regency's Pesisir region requires consideration of strengths and weaknesses, as well as opportunities and threats that exist in the area. The combination of SWOT strategy components refers to making optimal use of strengths and opportunities to minimize weaknesses and threats. Priority and problem mapping are essential in solving problems. This done so that the issue can be resolved as a whole and reduce the negative impact arising from a challenge.

Based on the results of the FGD and field observations, a description of the problems that exist in BUMDES, Sukasari Village, Kungkai Baru Village, and Lawang Agung Village are weak financial management, marketing constraints, availability of raw materials, business type selection, licensing of tourism forest management and support from local governments while the potential owned by BUMDES is high community cohesion and participation to support village programs, adequate human resources, and exotic places of worship and beaches.

Problems in the hierarchical analysis (AHP) are problems that are responded to and are considered necessary by respondents with consideration of issues and environmental conditions, as well as strategies developed based on SWOT analysis. Determination of the priority of problems in each village in the Seluma Coastal Region carried out using AHP, and the distribution of the issues illustrated by spatial analysis. The priority order of items in general at BUMDes in the Seluma Coastal region presented in Figure 3 below.

Figure 3. Priority of BUMDes Problems in the Seluma Regency Coastal Area



Source : Data processing results, 2019

Based on the AHP, three priority problems exist in BUMDes in the Seluma Regency coastal areas, including a weak BUMDes Management and governance system, as well as limited marketing access. Another problem is that the business units are relatively the same as other village-owned BUMDes such as renting chairs and tents so that this business unit has minimal marketing reach.

B. Discussions

The solution to the BUMDes problem in the Coastal region is always where management and financial governance issues

become a fundamental problem for the existing BUMDes through capacity building for BUMDes managers and management. This form of improvement can imply by attending training and comparative studies at BUMDes that have a similar business field to BUMDes owned. BUMDes Desa Lawang Agung and BUMDes Sukasari Village have a business unit in the area of Production, so it is better to conduct a comparative study to BUMDes whose business units are in the field of Production and proven to be successful, one of them is with indicators of community empowerment in supporting BUMDes that have been well implemented and improved the welfare of their village communities. For the Kungkai Baru village that has a business unit in the field of tourism, it can conduct a comparative study in a village that has a business unit in the field of tourism.

In the field of BUMDes financial governance so far, BUMDes Treasurers are not all of the educational backgrounds in the field of finance/accounting, so the recording is still very manual. It is not too problematic if the business turnover is still on a small scale, but it is quite troublesome if the businesses managed by BUMDes begin to develop. Increased capacity for financial managers is also a critical segment so that business turnover in terms of profit and whether or not it can be appropriately known. Some fundamental problems for BUMDes include the difficulty of marketing their products. The inability to compete with products outside is the only problem. The importance of support for BUMDes to sell their products so that consumers are interested in them is needed, in terms of training "branding" products both through good packaging to managing products from raw materials to finished products. The need for BUMDes and local governments to partner with third parties such as educational institutions or universities to carry out community service through assistance or guidance for BUMDes.

IV. CONCLUSION

The complexity of the problems faced by BUMDes in the Seluma district Coastal region must comprehensively be resolved. Based on the analysis of internal factors (IFAS), the main strength in the Seluma Coastal Region is community participation, while the main weakness is the means of transportation to the Seluma Regency coastal area. The results of the analysis of external factors (EFAS) show that the Seluma district's coastal environmental conditions can provide a positive response; opportunities can be utilized to minimize threats. The main opportunities that exist are the potential of coastal and marine resources, while the main threat is inadequate transportation facilities. Based on AHP results, four (4) priority problems that exist in BUMDes in coastal areas, including management, weak BUMDes financial governance, weak marketing access, and similarity of business units with other BUMDes. The problem-solving strategy is carried out by assessing the importance of the problem in the short and long term. In the short term, it is necessary to make efforts to increase the capacity of BUMDes for BUMDes managers, by identifying the role, potential, Business plan so that governance and management of BUMDes can run well. In the long run, it is hoped that the marketing reach will be wider with the use of

adequate human resources, including the use of information technology and social media. Innovation techniques can be carried out through product management in accordance with the standards desired by consumers, so they are able to compete with outside products.

Policy Implications This study is expected to be input to relevant stakeholders in solving BUMDes problems. Strategies that can use include the formulation of regulations and programs to increase the capacity of BUMDes HR and Innovation, For this reason, the plan that must be carried out in the effort to develop BUMDes is to study the BUMDes health check internally and build stronger synergy with local governments.

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Association of Fibrosis with the Proliferation Index of Liver Malignancy

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Abstract- Myofibroblast is a contractile cell type that has a high capacity to release ECM which will eventually cause fibrosis. TGF- β regulates the development of epithelial-mesenchymal transitions (EMT) and promotes fibrogenesis. TGF- β acts to encode proteins that regulate cell proliferation, differentiation, and growth and play a role in the main pathway of the myofibroblast signaling which will ultimately lead to fibrosis. TGF- β can also act as a tumor promoter through epithelial-mesenchymal transition (EMT) regulation. This study used tissue samples to analyze the correlation between fibrosis and the proliferation index in liver malignancy. Tissue paraffin block from 20 patients with liver malignancy was stained Massons trichrome then performed an assessment of the percentage of fibrosis area then performed re-cutting and Ki-67 immunohistochemical staining to assess the proliferation index and then searched for the extent of fibrosis with proliferation index on liver malignancy by testing spearman test. Fibrosis was assessed semi-quantitatively by calculating the percentage of the area of fibrosis. we found 35% of cases were in the range of 30-50% fibrosis. And 65% of cases have fibrosis <30%. Most cases show a high proliferation index, in 80% of cases, we found Ki-67 expressed more than 20% in the nucleus of the tumor cells. analysis of the spearman test there was no significant correlation between the fibrosis with the proliferation index of liver tumor cells.

Index Terms fibrosis, liver, proliferation index.

I. INTRODUCTION

During the wound healing process, the injured tissue undergoes an inflammatory process, which then progresses to the pro-fibrotic phase. Fibroblasts or other mesenchymal cells such as liver stellate cells (HSC) are activated by a disrupted tissue microenvironment, wherein infiltration of cells involved in wound healing reactions secretes cytokines and differentiates into myofibroblast.¹ Fibrosis also plays a major role in tumorigenesis. Most solid tumors are fibrotic because of a desmoplastic reaction to tumor development. Fibroblasts in tumors are known as cancer-associated fibroblasts (CAF), which have many images of myofibroblasts in organs with fibrosis but have very different phenotypes.²

Myofibroblast is a contractile cell type that has a high capacity to release ECM which will eventually cause fibrosis. TGF- β regulates the development of epithelial-mesenchymal transitions (EMT) and promotes fibrogenesis. TGF- β acts to

encode proteins that regulate cell proliferation, differentiation, and growth and play a role in the main pathway of the myofibroblast signaling which will ultimately lead to fibrosis. TGF- β can also act as a tumor promoter through epithelial-mesenchymal transition (EMT) regulation.^{1,3,4}

Proliferation marker Ki-67 (MCI67) located at 10q26.2 and served to encode antigens on proliferating cells. During the G1, S, and G2-M phases. Ki-67 was found to correlate with tumor growth rate, histological stage, and tumor recurrence. A high Ki-67 index indicates rapid progress and a poor prognosis in patients with hepatocellular carcinoma (HCC). Ki-67 expression is associated with TGFB1 expression in liver cancer tissue

TGF- β is responsible for encoding proteins that regulate cell proliferation, differentiation, and growth and play a role in the main pathway of myofibroblast signaling which will ultimately lead to fibrosis. TGF- β can also act as a tumor promoter through epithelial-mesenchymal transition (EMT) regulation. Therefore, we wanted to find out the association of fibrosis with the proliferation index of liver malignancy, which was assessed by Ki67 immunohistochemical expression in liver malignancy.

II. MATERIAL AND METHODS

Sample selection

This study is an analytic study with a cross-sectional design that aims to analyze the broad relationship of fibrosis with the proliferation index in liver malignancy. This research was conducted at the Anatomic Pathology Laboratory of the Faculty of Medicine, University of North Sumatra, Jalan Universitas No.1, Medan, and the Pathology Unit of the Anatomic Hospital of H. Adam Malik Hospital, Jalan Bunga Lau No.17 Medan.

The research sample was obtained through data storage software and obtained by a label/block paraffin from tissue that was diagnosed histopathologically as a malignancy with inclusion and exclusion criteria. The inclusion criteria in this study were all paraffin blocks from tissue diagnosed as liver cancer histopathologically and found fibrosis after examination with Masson's trichrome staining.

Immunohistochemistry protocol and interpretation

The area of fibrosis is identified by calculating the percentage of fibrosis identified by Masson's trichrome staining and then compared with the total area of tissue on the slide at 200x magnification: (1) score 0 for <5% fibrosis, (2) score 1 for 5% – 10% fibrosis, (3) score 2 for 10% – 20% fibrosis, (4) score 3 for 20% -30% fibrosis, (5) score 4 for 30% -50% fibrosis, (5) score 5

for > 50% fibrosis. The proliferation index is identified by the presence of brownish granules which are colored in the cell nucleus by the Immunohistochemical Ki-67 staining (Scy Tek, Logan, Utah, America.) Ki-67 Antigen; Polyclonal (Ready-To-Use), Rabbit Synthetic peptide from 62 base pair region of the human Ki-67 antigen. Percentage is assessed from 1000 cells identified at 400x magnification, then categorized based on the modified criteria made by Xuhui Ma, et al with the following criteria: (1) score 0 for <5% positive cells, (2) score 1 for 5% -10% positive cells, (3) score 2 for 10% -20% positive cells, (4) score 3 for 20% -30% positive cells, (5) score 4 for 30% - 50% positive cells, (6) score of 5 for> 50% positive cells.

Statistical analysis

Statistical analysis was performed using SPSS software package version 22.0 (SPSS Inc., Chicago). Spearman test was applied to find out the association of fibrosis with the proliferation index of liver malignancy. The p-values < 0.05 were considered significant.

III. RESULT

Patients' characteristics

The mean age for liver malignancy in this study was 45.65 years, the youngest age was 15 years and the oldest was 66 years. In distribution by sex, we found 13 (65%) cases of men and 7 (35%) cases of women. the ratio of men and women in this study was 1.3: 0.7

Table 1. Characteristic of liver malignancy patients

Characteristics	Number of cases	Percentage (%)
age, mean	45,65	
sex		
male	13	65 %
female	7	35%

Fibrosis distribution

In this study, the largest area of fibrosis was found in score 4, on the range of 30-50% fibrosis, in 7 (35%) cases. While for the fibrosis area less than 5%, we found in 5 (25%) cases. Median (Min-Max) value of the fibrosis in this study was 18 (1-45)

Table 2. Frequency distribution of fibrosis

fibrosis	Score	f	%
Mean±SD= 21,1±14,94			
Median (Min-Max)= 18 (1-45)			
<5% fibrosis	0	5	25%
5% - 10% fibrosis	1	0	0%
10% - 20% fibrosis	2	6	30%
20% - 30% fibrosis	3	2	10%
30% - 50% fibrosis	4	7	35%
> 50% sel fibrosis	5	0	0%

Proliferation index

We assessed the proliferation index using the Ki-67 immunohistochemical staining and then assessed its expression

in 1000 tumor cell nuclei. The highest proliferation index was found in score 3 and score 4, in the range of expression of Ki-67 20-30% and 30 -50%, respectively in 7 (35%) cases. And the lowest proliferation index we found in score 0, in the range of expression Ki-67 <5%, in 1 (5%) case. From the data, we also found the Median (Min-Max) Proliferation index frequency was 29.2 (4.70-89.30)

Table 3. Frequency distribution of Proliferation index

Proliferation Index	Score	f	%
Mean±SD			
31,97±20,07			
Median (Min-Max)			
29,2 (4,70-89,30)			
<5% sel positif	0	1	5%
5% - 10% sel positif	1	2	10%
10% - 20% sel positif	2	1	5%
20% - 30% sel positif	3	7	35%
30% - 50% sel positif	4	7	35%
> 50% sel positif	5	2	10%

Association between the fibrosis and Proliferation index

Table 4. Spearman correlation test for fibrosis with proliferation index.

Variable	Fibrosis		
	n	r	p
Proliferation Index	20	-0,107	0,474

The Spearman correlation test in 20 cases of liver malignancy in this study, it was found that fibrosis statistically did not show a correlation to the proliferation index. This was indicated by the Spearman correlation coefficient (r) of -0.107 and the P-value of 0.474

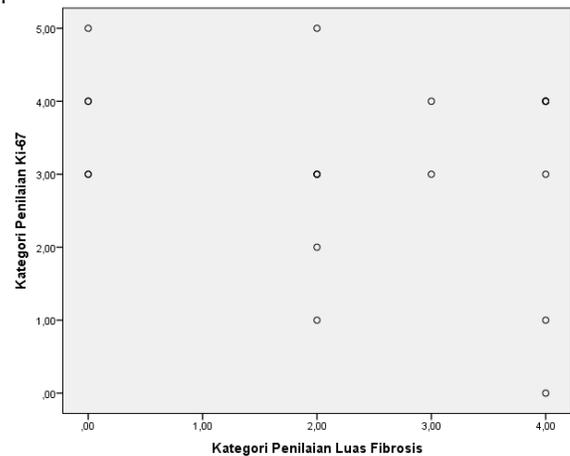


Figure 1. Scatter plot graph

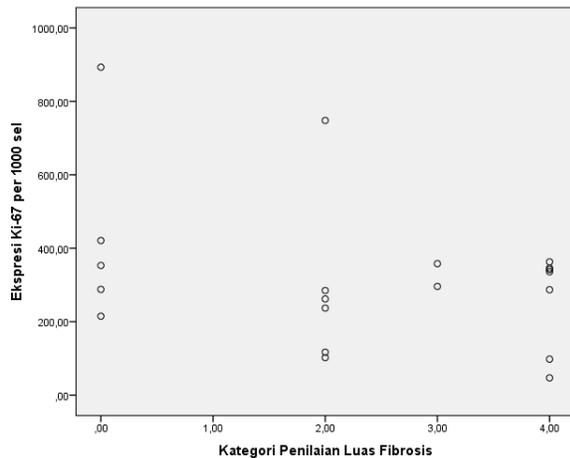


Figure 2. Scatter plot graph.

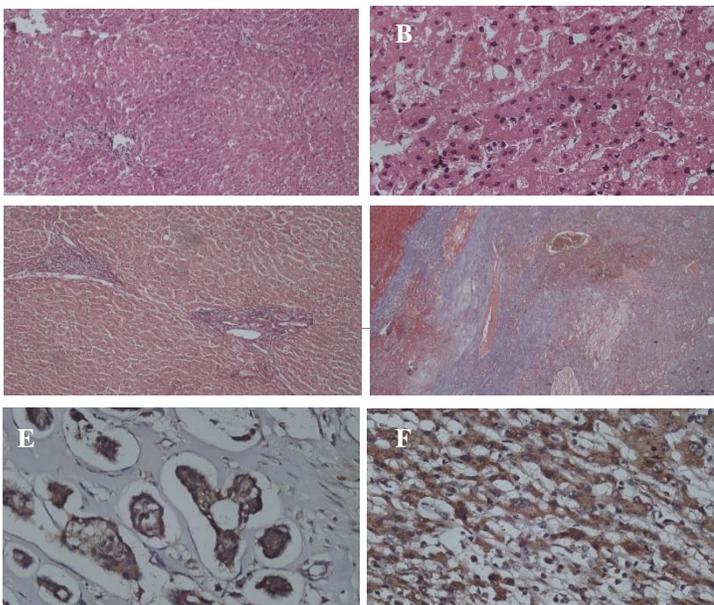


Figure 3. (A) Hepatocellular carcinoma. H&E, 40X. (B) Hepatocellular carcinoma H&E. 400X (C) Minimal portal fibrosis appears blue with Masson's Trichome staining, 40X. (D) Extensive fibrosis appears blue with Masson's Trichome, 40X. (E) Immunohistochemical Ki-67 on the breast tissue (Control) 400X. (F) Immunohistochemical Ki-67 expression on HCC 400X

IV. DISCUSSION

HCC is the most common primary malignant tumor of the liver and attacks men 3 to 4 times more often than women. HCC is the fifth most common malignancy in men and the ninth most common in women.⁵ Data from the Surveillance, Epidemiology, and End Result (SEER) cancer statistics database shows that the annual incidence rate for men is 6.7 per 100,000 years compared to 2, 0 per 100,000 years for women. The peak incidence in women occurs 2 decades later than in men which is 4.4 per 100,000 years at the age of 65 to 69 years and 4.2 per 100,000 years at the age of 45 to 49 years.⁶ In this study, it was found that

the average age of sufferers of liver malignancy was 45.65 years and men were more common than women. The ratio between males and females in this study was 1.3: 0.7. This is not much different from other studies.

Fibrosis quantity calculation system can be done by measuring tissue thickness using a micrometer that has been calibrated at 400x magnification.⁷ In this study fibrosis was assessed semi-quantitatively by calculating the percentage of area of fibrosis in the entire field of view of the slide which had previously been diagnosed histopathologically as a case of malignancy in heart, we have not used computerized systems analysis to get more accurate results. Furthermore, the results obtained are categorized into 6 values, namely: (1) Value 0 for fibrosis <5%, (2) Value 1 for fibrosis 5% -10%, (3) Value 2 for fibrosis 10% -20%, (4) Value 3 for fibrosis 20% -30%, (5) Value 4 for fibrosis 30% -50%, (6) Value 5 for fibrosis > 50%.

Toyoda H et al. reported that the degree of liver fibrosis was an important factor related to the recurrence of HCC in patients who had previously undergone curative liver resection.⁸ In other studies, according to Toyoda et al., prognostic factors for HCC such as tumor development, liver function, and liver fibrosis significantly influence the survival of HCC patients. There are variations of these prognostic factors. Tumor development factors have a strong impact in the short term and liver fibrosis has a strong impact and long after diagnosis. Then, liver function has a constant prognostic effect on patient survival after diagnosis.⁹ In this study, most patients had fibrosis in the range of 30-50% of the tumor tissue area observed, in 7 (35%) cases.

In the development of cancer, unlimited cell proliferation is believed to have an important role. In addition, programmed cell death called apoptosis, regulated by several oncogenes and tumor suppressor genes has become an important pathway for carcinogenesis.⁴¹ Dong Sup Yoon et al. Conducted a study of cell proliferation index and expression of p53 and Bcl-2 in tumor lesions. and non-tumor hepatocellular carcinoma and metastatic liver cancer. In the research, he found that the expression of Ki-67 was equally increased in both primary liver cancer and metastatic liver cancer.¹⁰

In this study, the results of various Ki-67 expressions were found, but most of them showed a high proliferation index where 80% of samples showed Ki-67 colored more than 20% in the nucleus of tumor cells with a median of 29.2. This study divides the assessment of the proliferation index into six categories referring to research conducted by Xuhui Ma, et al, the categories were: (1.) score 0 for <5% positive cells, (2.) score 1 for 5% – 10% positive cell, (3.) score 2 for 10% -20% positive cell (4.) score 3 for 20% -30% positive cell, (5.) score 4 for 30% -50% positive cell, (6.) score 5 for > 50% positive cells.³⁴ This study has not used a calculation system with computer analysis to calculate the Ki-67 expression. The calculation is done manually on 1000 cells carried out at 400X magnification then counted the number of colored cell nuclei and assessed the percentage.

The prognosis of patients with liver malignancies is determined by various factors. Immunohistochemical Ki-67 is a fast, simple and sensitive detection technique for the activity of liver cancer cell proliferation, and overexpression (> 10%) can predict recurrence of liver cancer after surgical treatment, which is associated with death of liver cancer patients.⁴¹ Chengkun Yang et al. investigated the expression of Ki-67 proliferation

markers associated with TGF beta 1 can predict the prognosis of patients with hepatocellular carcinoma associated with hepatic B viruses. he found that the level of Ki-67 expression has an association with TGF beta 1 expression in liver cancer tissue and HepG2 cells.⁴

Several reports on cell proliferation and apoptosis in the development of human liver disease have been published, but the area of fibrosis and its relationship to the cell proliferation index in liver malignancy have not been discussed. In this study, we sought the relationship of fibrosis with the proliferation index in liver malignancy by using statistical analysis to obtain data as a reference for the prognosis of liver cancer based on the area of fibrosis associated with the proliferation index in the liver malignancy. From the Spearman correlation test conducted on 20 samples of liver malignancies in this study, it was found that the extent of fibrosis statistically did not show a correlation with Ki-67 immunohistochemical expression. This is indicated by the Spearman correlation coefficient (r) of -0.107 and the P-value of 0.474.

Noda et al. Evaluated the effects of various levels of fibrosis as a prognosis in non-viral HCC patients, and found no significant association between liver fibrosis and overall survival in HCC patients (p = 0.1185).¹¹ in other studies that conducted by Suh et al who examined the effect of liver fibrosis as a prognosis in HCC with Child-Pugh grade A and HCC with a single lesion <5 cm found that there was no significant difference in survival rates between mild and severe fibrosis (P = 0.267).¹² However, according to Toyoda et al, liver fibrosis can indicate the potential for the development of HCC and increase the impact of liver fibrosis in the long term after being diagnosed as HCC. And it also indicates the potential factor for the development of new HCC. In another study, Kaibori et al., Reported that the degree of liver fibrosis was an important factor associated with HCC recurrence in patients long after curative liver resection.¹³ Fibrosis is likely to further influence the progression of liver malignancy by engaging in the process of tumorigenesis, but less influencing cell aggressiveness. liver cancer cells and do not have a significant relationship with the proliferation index.

V. CONCLUSION

There is no significant association between fibrosis and the proliferation index.

COMPETING INTERESTS

The authors have no relevant financial interest in the products or companies described in this article.

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ETHICAL APPROVAL

Health Research Ethical Committee, Universitas Sumatera Utara, Medan, Indonesia approved this study.

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The correlation between cytology of tuberculosis through eosinophilic mass containing brown particles feature and various bacterial strain

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Abstract-It has been proved that diagnostic cytology of tuberculosis through eosinophilic mass containing brown particles feature can be used to establish diagnose of tuberculous lymphadenitis. The eosinophilic mass containing brown particles is not a classical histopathology feature of tuberculous infection. Many patients with TB-HIV (Tuberculosis-Human Immunodeficiency Virus) do not show classical feature of TB on pathology examination. Some studies suggest that there is another Mycobacterium strain relates to cytology feature as a specific lymphadenitis. The objective of this study is to find the correlation between cytology of tuberculosis through eosinophilic mass containing brown particles feature and various bacterial strain including *M. tuberculosis*, *M. avium*, and other bacterial strains. This study uses fine needle aspiration cytology as a quick, easy and low cost diagnostic tool to detect tuberculous infection especially in lymph nodes of the neck through eosinophilic mass containing brown particles feature. Some of the aspiration will be continued to be examined by PCR to determine the mycobacterium strain. The correlation between eosinophilic amorphous mass containing dark brown particles and Mycobacterium tuberculosis and Atypical Mycobacterium is not statistically significant, eventhough there is a statistically significant correlation between eosinophilic amorphous mass containing dark brown particles and all mycobacterium strains. We conclude that eosinophilic amorphous mass containing dark brown can be found on Mycobacterium tuberculosis and other Atypical Mycobacterium strains.

Index Terms-Tuberculosis, cytology, eosinophilic amorphous mass

I. INTRODUCTION

Lymphaneopathy is disease of the lymph nodes, in which they are abnormal in size and consistency.¹ Basically, lymphadenopathy is caused by immune response against infection or inflammatory response to infection involving lymph node. It also might be caused by neoplastic cells that infiltrate lymph nodes through lymphatic or blood circulation system.²

Lymphadenitis is an infection in lymph nodes. It is usually because of viral and bacterial infection.³ Lymphadenitis

can be caused by infection of Mycobacterium tuberculosis and Atypical Mycobacterium.^{4,5}

Tuberculosis (TB) is one of top ten causes of death worldwide. Million people suffer from TB each year. There are three countries that contributing almost half of MDR/RR-TB cases globally: India (24%), China (13%) and Russian Federation (10%).⁶ Indonesia itself is currently doing survey on antituberculosis drug resistance.⁷

Lymph node enlargement is the main target for fine needle aspiration cytology (FNAC). FNAC of lymph node can be used as an initial diagnostic examination to the patient with lymphadenopathy since it can give a quick result with minimal trauma, less complication and more cost effective.⁹

Developed analysis by using polymerase chain reaction (PCR) method can be used to resolve the limitation of distinguishing between Mycobacterium tuberculosis and Atypical Mycobacterium.¹⁰ PCR enables direct, sensitive and specific diagnose when identifying bacteria.¹¹

II. MATERIAL AND METHODS

Sample selection

This study is descriptive and analytic design to find out the Atypical Mycobacterium existence by fine needle aspiration cytology which confirmed by PCR with cross-sectional approach. All samples was collected using consecutive sampling. All subjects with lymphadenitis came in sequence. Sample was obtained by fine needle aspiration biopsy and confirmed by using PCR. The procedure of fine needle aspiration of lymph node is using 10 cc disposable syringe with 23G needle or diameter 0,65 mm and 3 cm length or 9 cm length. The disposable syringe is attached to comecco syringe pistol holder. Aspiration of the lesion was performed by doing some maneuvers and then making specimen preparation and staining with May Grunewald Giemsa (MGG). The next step was preparing PCR with conventional method to determine atypical mycobacterium. Reference of mycobacterial was according to ATCC (American Type Culture Collection), PCR amplification had an accordance with Mycobacterium avium ATCC 19074 forward GCC GCC GAA ACG ATC TAC, reverse AGG TGG

CGT CGAGGA AGA, Mycobacterium bovis ATCC 19210 with ACA AGA CAT GCA TCC CGT, Mycobacterium chelonae ATCC 14472 with AAG CGA GTA ACC ACT ACA GA AAC, Mycobacterium fortuitum ATCC 6841 with GGG TAA GAC CCA GTG TCT CAA CC, Mycobacterium kansasii ATCC 12478 with CAC GCG GGA TGC GTT TAC GGTG, Mycobacterium paratuberculosis ATCC 19698 with GGC GTT GAG GTC GAT CGC CCA CGT GAC, Mycobacterium phlei ATCC 11758 with TCC CAG CCA TGC AAC CAG, Mycobacterium smegmatis ATCC 19420 with CGA CCA GCA GGG TGT ATT, Mycobacterium xenopi ATCC 19250 with TCC GAC GAA GTC GTA ACA AGG.

III. RESULT

This study revealed 66 patients with lymphadenitis, 50 of them (50/66) were lymphadenitis tuberculosis and 16 patients (16/66) were non specific lymphadenitis (non mycobacterium infection and abscess).

Table 1. Correlation between eosinophilic amorphous mass and Mycobacterium tuberculosis

Cytology feature	Result of PCR				p-value
	M. Tuberculosis (+)		M. Tuberculosis (-)		
	N	%	N	%	
Eosinophilic amorphous mass / Tipe III (+)	15	22,7	13	19	0,356
Eosinophilic amorphous mass (-)	16	24,2	22	33,3	

***Chi Square Test**

Based on Chi Square test, there was no significant correlation between eosinophilic amorphous mass containing dark brown particles and Mycobacterium tuberculosis.

Table 2. Correlation between eosinophilic amorphous mass and Atypical Mycobacterium

Cytology feature	Result of PCR				p-value
	Atypical Mycobacterium		Non Mycobacterium		
	N	%	N	%	
Eosinophilic amorphous mass (+)	4	6,1	24	36,4	0,446
Eosinophilic amorphous mass (-)	3	4,5	35	53	

***Fishers Exact Test**

Based on Fishers Exact test, there was no significant correlation between eosinophilic amorphous mass containing dark brown particles and Atypical Mycobacterium.

Table 3. Correlation between eosinophilic amorphous mass and all Mycobacterium strains

Cytology feature	Result of PCR				p-value
	All strains (+)		All strains (-)		
	N	%	N	%	
Eosinophilic amorphous mass (+)	28	42,4	0	0	<0,001
Eosinophilic amorphous mass	22	33,3	16	24,2	

(-)

***Fisher Exact Test**

Based on Fishers Exact test, there was significant correlation between eosinophilic amorphous mass containing dark brown particles and all Mycobacterium strains.

IV. DISCUSSION

Lymphadenitis is usually caused by Mycobacterium tuberculosis and Atypical Mycobacterium.^{12,13} It is not frequent to isolate this Mycobacterium tuberculosis from Atypical Mycobacterium.¹³ The entire 66 patients were cytologically diagnosed with lymphadenitis, 50 of them were lymphadenitis tuberculosis and 16 patients were non specific lymphadenitis.

Most patients are cytologically diagnosed as Mycobacterium tuberculosis (50 cases/75,8%). This result corresponds to the study of Mohaputra in India which is based on fine needle aspiration biopsy and culture. This also corresponds to the study of Suryadi which states that lymphadenitis tuberculosis is found 38,14% more by cytology.^{14,15} Lymphadenitis tuberculosis is disease of lymph nodes due to Mycobacterium tuberculosis that can involve various extrapulmonary organs, in which is an inflammatory response in lymph nodes as a manifestation of Mycobacterium activity.

Our study revealed 31 cases of Mycobacterium tuberculosis (47%) by using PCR. This result has accordance with the study of Bensi in Brazil by using sputum culture method, which revealed 91 cases of Mycobacterium tuberculosis while only 26 cases of Atypical Mycobacterium.¹⁶ The study of Lima also states that Mycobacterium tuberculosis is more found than Atypical Mycobacterium. The study of Lima obtained the sample from sputum, broncho alveolar lavage (BAL), urine, aspiration biopsy of skin lesions, pleural fluid, and bone biopsy.¹⁷

Our recent study demonstrates that eosinophilic amorphous mass containing dark brown particles is not only found in Mycobacterium tuberculosis and Atypical Mycobacterium, but also found in all Mycobacterium strains (significant correlation). This has accordance with the study of Lubis which cytologically revealed the structure with eosinophilic amorphous mass containing dark brown particles (eosinophilic amorphous mass feature) in specimens from aspiration biopsy of untreated lymph node TB. This study suggested that eosinophilic amorphous mass can be used to diagnose lymphadenitis TB and to distinguish TB and non TB abscess. This study used 20% kudoh culture medium (Ogawa medium modification) and had 194 samples, 110 cases with eosinophilic amorphous mass and 84 cases without eosinophilic amorphous mass. This study revealed 97% sensitivity, 81% specificity, positive predictive value was 83%, negative predictive value was 96%, 89% accuracy, and 48% prevalence.¹⁸

Khan in 2013 concluded that FNAC was sensitive test and very specific to diagnose lymphadenitis tuberculosis with 77% sensitivity and 98% specificity. Prasoon and Chikkannaiah reported that eosinophilic structure derived from FNA had significant correlation between eosinophilic amorphous mass and Acid Fast Bacilli (AFB) existence in the lesions of lymphadenitis tuberculosis (58,33% and 55,5%).^{19,20}

Muyanja confirmed preparation from aspiration biopsy by using hystopathology examination and revealed 93,1%

sensitivity, 100% specificity.²¹ The study of Delyuzar on 95 positive TB cases (eosinophilic amorphous mass feature) by using PCR revealed 98,95% sensitivity, 96,7% specificity, positive predictive value was 96,91%, and negative predictive value was 98,97%.²²

V. CONCLUSION

Eosinophilic amorphous mass containing dark brown particles correlates not only with *Mycobacterium tuberculosis*.

Eosinophilic amorphous mass containing dark brown particles correlates not only with Atypical *Mycobacterium*.

Eosinophilic amorphous mass containing dark brown particles correlates with all *Mycobacterium* strains.

COMPETING INTERESTS

The authors have no relevant financial interest in the products or companies described in this article.

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ETHICAL APPROVAL

Health Research Ethical Committee, Universitas Sumatera Utara, Medan, Indonesia approved this study.

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Factors Affecting Implementation of Customs Integration in East Africa

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Abstract- A customs union refers in general terms to a political structure established by two or more states apparently not only to create a free trade platform but also to establish a common trade policy towards third countries, including the creation of common trade barriers. While progress has been made so far, significant aspects of these modules remains to be done. There has been problem of non-uniform customs tariffs existing within the E.A member states slowing down faster integration. The main purpose of the research study was to establish the institutional factors affecting implementation of customs integration in East Africa. The study narrowed its research undertakings into three major specific objectives which were to evaluate the effect of Revenue Collection Methods on implementation of customs integration in East Africa, to assess the effect of Infrastructure development on implementation of customs integration in East Africa and to investigate the effect of capacity development on implementation of customs integration in East Africa. The study area was Kenya border posts with Uganda and Tanzania. The sample size was 145 respondents. The study adopted stratified random sampling where the population was divided into stratum and the sample was selected randomly. The study found out that a strong and positive relationship between Revenue Collection Methods and implementation of custom integration. The relationship was significant ($r = 0.336$, $p < 0.01$). There was a strong and positive relationship between Infrastructure development and implementation of customs integration in East Africa. The relationship was significant at ($r = 0.223$, $p < 0.01$). There was a very strong and positive relationship between capacity development improvement and cross boarder logistics efficiency. The Relationship is significant at ($r = 0.335$, $p < 0.01$). The value of R^2 is 0.239, revealing 23.9% variability in factors relating to Revenue Collection Methods, Infrastructure development and Infrastructure development improvement accounted to implementation of custom integration variables in the model developed. Anova results shows that the p-value of 0.000 that is below 5% significance shows that Revenue Collection Methods, Infrastructure development and Infrastructure development improvement has little but significance effect on custom integration. The beta coefficients result showed that this model implies that every per unit increase in Revenue Collection Methods leads to 0.238 increase in implementation of custom integration. An increase in Infrastructure development leads to -0.032 decrease in implementation of custom integration. A unit increase in capacity development improvement leads to 0.252 increase in implementation of custom integration. The study concluded that there has been little improvement in Revenue

Collection Methods since implementation of custom integration in E.A. East Africa partner states has poor Infrastructure development which is a major hindrance to custom integration. Employees are not skilled enough to facilitate implementation of custom integration. The study recommended that the East African Member states need to come up with common policies that will improve Revenue Collection Methods at the border point, come up with policies that are aimed at ensuring Infrastructure development projects development that supports custom integration and finally a common policy that support capacity development improvement for customs integration within East African member states for mutual benefit. However, further study is necessary to identify other institutional factors affecting implementation of customs integration in East Africa.

Index Terms- Capacity development- In what capacity development can ask in what role or function E. A member states are performing in. It also means the ability or power to do, experience, or understand something

Custom Integration- Simplifying Rules and Procedures for Freer Flow of Goods.

Infrastructure development- the basic physical and organizational structures and facilities (e.g. buildings, roads, and power supplies) needed for the operation of a society or enterprise.

Revenue Collection Methods- Revenue Collection Methods generally relates to a government agency's actions to collect outstanding financial obligations from the public. Revenue might come from a variety of sources: taxes, license fees, fines or use of state facilities.

I. INTRODUCTION

The Customs Union implementation can be meaningful if there is net benefit to each Partner states, which would have not been realized without it. The issue is not whether the partners benefit equally but it is important that each partner state feels that there are benefits directly gained from the Customs Union. Such benefits will however, not come on a silver plate. It implies hard work. It means that as a country, we need to build productive capacity development to take advantage of the export potential, in the region. The Customs Union has also raised a lot of questions, uncertainty and anxiety. The biggest threat to the Customs Union is fear of the unknown. The Partner States, the Fast African Community Secretariat and the private sector institutions have a duty to conduct and sensitize members of the private, public and

Fast Africans in general about the Customs Union and what is in it to the East Africans (Cooksey, 2016).

The strides taken by the EAC to have a Customs Union Protocol in force and a Community Law - the Customs Management Act - made it attractive to other countries such Rwanda and Burundi to access the Treaty in 2006. The latter two countries became fully fledged members of the EAC in July 2007, and started to implement the Customs Union in 2009. The Republic of Southern Sudan has applied to join the EAC and the process of evaluating her admission is ongoing. Currently the EAC is recognized globally and representatives from various countries and international organizations have submitted their credentials to the Secretary General of the East African Community. There are other countries envying to join the regional bloc, as the Summit of EAC Heads of State and Government have said in their 2011 Communiqué. The region has increased both inter- and intra-regional trade, and has also witnessed an increase in intra-EAC Foreign Direct Investments (FDI) as well as in FDI from outside (Masinde, 2015)

II. RESEARCH AND COLLECT IDEA

Comparative Advantage Theory

The comparative advantage theory on the other hand, was first advanced by David Ricardo, an English economist, as a challenge to the absolute advantage theory. The theory holds that under free trade, an agent will produce more of and consume less of a good for which they have a comparative advantage. Unlike the absolute advantage theory which focuses purely on the ability of a country to produce goods more efficiently than another nation, the comparative advantage theory holds that where a country cannot produce a product more efficiently than the other country, chances are that it can produce that product better and more efficiently than it does other goods.

Regional Integration Theory

Regional integration theory seeks to explain the establishment and development of regional international organizations (Bonilla, 2016). Key questions are why and under which conditions states decide to transfer political authority to regional organizations, how regional organizations expand their tasks, competencies, and members, and what impact they have on states and societies in their regions. Whereas regional integration theory started with a broad comparative regional and organizational scope in the 1950s and 1960s, it has since focused on European integration, the European Union and lately, the EAC. Regional integration has been organized either via supranational institutional structures or through intergovernmental decision-making, or a combination of both.

Revenue Collection Methods and Implementation of Custom Integration

Widdowson, Blegen, Kashubsky & Grainger (2014) postulates that member countries are reluctant to implement an agreement to avoid double taxation due to the fear of making them unattractive to foreign direct investment. Moreover, tax exemptions are effective in attracting foreign direct investment, as they prefer tax exemptions, capital gains exemptions, and special exemptions from value added taxes and reduced stamp duty rates.

To this end, the harmonization of tax policies to eliminate tax distortions in order to achieve a more efficient allocation of resources in the context of tax harmonization would be unrealistic as this would require the same tax rates across the EAC partner states.

Infrastructure development and Implementation of Custom Integration

Grethe (2018) examined the factors that influence economic integration in the East African Community (EAC). The discovery revealed that economic integration into EAC is influenced by factors within the EAC structure. EAC executives were found to have the appropriate skills and competences to promote economic integration (51.5%). On the other hand, he realized that most of the articles of the established CAO Treaty are not really respected. There is no free circulation of people, goods and services in EAC (74%). It was found that the weak points within the EAC structure that influence economic integration are the non-harmonized presidential electoral systems, the state leaders are not firm enough to follow the agreements of the implementation protocol, the non-harmonized policies, the lack of trust among the people of EAC, the different economic configurations and the fear of losing sovereignty in their respective states.

Capacity development and Implementation of Custom Integration

Gwengi (2018) studied the analysis of the political economy of the East African Community (EAC), focusing on what drives and limits this regional organization to promote economic integration. In particular, it analyses the transport Infrastructure development and the monitoring of commercial policy, in particular the system for monitoring the implementation of regional integration. Structural factors, such as geography and shared historical experiences, continue to have a constant influence on the EAC policy options and on the effectiveness of the implementation of EAC policies. The solid informal institutions that have influenced the implementation of the EAC policy include sponsorships and a permits culture in the EAC, which encourages incentives for EAC officials and Member State representatives that are detrimental to the organization's effectiveness.

III. STUDIES AND FINDINGS

On whether there has been improvement in Revenue Collection Methods since implementation of customs integration was shown by ($M=2.9640$ $SD=1.27637$) who were neutral, the conclusion is that there has been little improvement in Revenue Collection Methods since implementation of custom integration since the member states. Majority of the respondents were neutral that there has been a little improvement in tax collection since implementation of customs integration as evidenced by ($M=3.3885$ $SD=0.82102$), this shows that custom integration has led to little improvement in tax collection. On whether there were proper measures on revenue administration since implementation of customs integration as shown by ($M=2.8129$ $SD=1.18302$), majority of respondents were neutral, the conclusion is that there were no proper measures in place to enhance revenue

administration among E.A member states. Majority of respondents agreed that there has been reduced cases of corruption since implementation of customs integration as shown by ($M=2.9640$ $SD=1.27637$), the conclusion is that there have been some levels of transparency in revenue collected which has helped implement of customs integration.

On whether Infrastructure development affects custom integration, respondents agreed that Infrastructure development affects custom integration as shown by ($M=4.3885$ $SD=0.82102$), the conclusion shows that Infrastructure development affects custom integration. Majority Respondents disagreed that East Africa member states has good road network as shown by ($M=2.1295$ $SD=1.16868$), the conclusion shows that there has not been Infrastructure development; poor Infrastructure development is a major hindrance to custom integration. Respondents were neutral that there has been coordination between member states since implementation of customs integration as indicated by ($M=3.2302$ $SD=1.43616$), the conclusion is that there has been little coordination between member states on implementation of custom integration. Respondents were neutral that east Africa member states has good railway network as evidenced by ($M=3.2014$ $SD=1.38407$), the conclusion is that E.A member states have not been improving the railway network.

Majority of employees have skills to facilitate implementation of customs integration were neutral as indicated by ($M=3.2302$ $SD=1.38407$), this shows that employees were not skilled enough to facilitate implementation of custom integration. On whether there are resources to support implementation of customs integration as indicated by ($M=3.2302$ $SD=1.33143$), majority of respondents were neutral, this shows that there were no adequate resources to fully support implementation of custom integration, majority of respondents were neutral. Respondents who were neutral indicated that employees are competent to support implementation of customs integration as indicated by ($M=3.0863$ $SD=1.17017$), this shows that employees are little competent. Respondents indicated to a moderate extent that there is technology to facilitate customs integration as indicated by ($M=3.2230$ $SD=1.35691$), this shows that the available technology was not adequate used to facilitate implementation of custom integration.

On whether implementation of customs integration has reduced the cost of logistics integration as indicated by ($M=4.1727$ $SD=1.15425$), majority of respondents agreed, this shows that there is reduced cost of logistics in customs integration. Respondents who were majority strongly agreed that implementation of customs integration has reduced delivery time as indicated by ($M=4.5180$ $SD=0.68457$), this shows that there has been reduction in delivery time since the implementation of custom integration. Respondents agreed that implementation of custom integration has led to growth and development of member states as evidenced by ($M=4.3885$ $SD=0.82102$), this shows that customs integration has led to development of member states. Respondents indicated to a great extent that implementation of customs integration has increased the competitiveness of a country's exports as evidenced by ($M=4.3381$ $SD=0.86438$), this shows that there has been increased competitiveness of exports since the implementation of custom integration. Majority of respondents agreed that tariffs act as a barrier to logistics

efficiency as evidenced by ($M=4.0567$ $SD=0.74959$), this shows that there has been barriers in logistics efficiency.

The p -value of the t -test for this variable is 0.008. Since the p -value 0.008 is below 0.05, the null hypothesis is rejected. Hence, the study finds that Revenue Collection Methods has significant effect on implementation of custom integration. The study findings agree with Gerring S.K (2014), who argued that if the p -value is less than the chosen significance threshold (equivalently, if the observed test statistic is in the critical region), then we say the null hypothesis is rejected at the chosen level of significance. The p -value of the t -statistic for the variable Infrastructure development is 0.760. Since the p -value 0.760 is above than 0.05, the null hypothesis is accepted and the alternative hypothesis rejected. This means that Infrastructure development has no significant effect on implementation of customs integration in East Africa. The study findings agrees with Rezaee (2016) who argued that If the p -value is not less than the chosen significance threshold (equivalently, if the observed test statistic is outside the critical region), then the evidence is insufficient to support a conclusion.

A simple regression analysis has shown a statistical significance relationship between capacity development improvement and implementation of custom integration, 0.022. Since the p -value 0.022 is below 0.05. Thus, we reject the null hypothesis, thus capacity development has significant effect on implementation of custom integration. The study findings agree with Gerring S.K (2014), who argued that if the p -value is less than the chosen significance threshold (equivalently, if the observed test statistic is in the critical region), then we say the null hypothesis is rejected at the chosen level of significance.

IV. CONCLUSION

There has been some little improvement in Revenue Collection Methods since implementation of custom integration since the member states. The custom integration has led to little improvement in tax collection among member states. There were no harmonized policies in place to enhance revenue administration among E.A member states. There have been some levels of transparency in Revenue Collection Methods since the implementation of customs integration but more need to be done to eliminate corruption so as to ensure there is maximum Revenue Collection Methods.

Infrastructure development affects custom integration. There has not been Infrastructure development; poor Infrastructure development is a major hindrance to custom integration. There has been little coordination between member states on implementation of custom integration. They lack good policies to develop Infrastructure development that will make custom integration a reality. East African member states have not been improving the railway network thus hindering movement of goods among member states.

Employees were not skilled enough to facilitate implementation of custom integration. There are no regular training programs among staff at the customs department. Proper policies are necessary to develop skills of custom officials. There were no adequate resources to fully support implementation of custom integration. Employees are little competent. The available

technology was not adequate to facilitate implementation of custom integration.

V. APPENDICES

Appendix I: Introduction Letter

Date:

To Chief Executive Office

NAIROBI.

Dear Sir/ Madam,

RE: CONSENT FOR PROVISION OF ACADEMIC DATA

I am an MBA student at Moi University. I wish to conduct a study entitled “effect of customs administration on cross border logistics efficiency among East African member states”

To facilitate the completion of this study, I wish to humbly request for your assistance with certain data from your organization. I have attached a copy of the questionnaire. Kindly answer all the questions as completely as possible. The study results are intended for academic purposes only and will be treated with utmost confidentiality. No specific reference will be made on your organization and only the summary results will be made public.

I look forward to your utmost support and remain grateful.

Yours Sincerely

Felix Kilonzi

Appendix II: Questionnaire

This section has questionnaire on the institutional factors affecting implementation of customs integration in East Africa. Please tick the most appropriate response to questions that give possible answers and write down the answers in the spaces provided in the open and close ended questions. The purpose of the research is purely academic and information revealed will be held with utmost confidentiality to anyone.

SECTION A: GENERAL INFORMATION

1. Please indicate the gender:

Male

Female

2. Please indicate age bracket

Below 20 years

21-30 years

31-40 years

Above 41 years

3. Highest Education Level

Primary school level

Secondary school level

Diploma level

University level

SECTION B: IMPLEMENTATION OF CUSTOMS INTEGRATION

Please state the extent to which you agree or disagree with the following statements regarding implementation of customs integration (1 strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree and 5 strongly Agree)

	1	2	3	4	5
Implementation of customs integration has reduced the cost of logistics					
Implementation of customs integration has reduced delivery time					
Implementation of custom integration has led to growth and development of member states					
Implementation of customs integration has increased the competitiveness of a country's exports					
Tariffs act as a barrier to logistics efficiency					

SECTION C: REVENUE COLLECTION METHODS

Please state the extent to which you agree or disagree with the following statements regarding Revenue Collection Methods (*1 strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree and 5 strongly Agree*)

	1	2	3	4	5
There has been improvement in Revenue Collection Methods since implementation of customs integration					
There proper measures on revenue administration since implementation of customs integration					
There has been an improvement in tax collection since implementation of customs integration					
There has been reduced cases of corruption since implementation of customs integration					

SECTION D: INFRASTRUCTURE DEVELOPMENT

Please state the extent to which you agree or disagree with the following statements regarding Infrastructure development (*1 Strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree and 5 strongly Agree*)

	1	2	3	4	5
Infrastructure development affects customs integration					
East Africa member states has good road network					
There has been coordination between member states since implementation of customs integration					
East Africa member states has good railway network					

SECTION E: CAPACITY DEVELOPMENT

Please state the extent to which you agree or disagree with the following statements regarding capacity development (*1 Strongly Disagree, 2 Disagree, 3 Neutral, 4 Agree and 5 strongly Agree*)

	1	2	3	4	5
Employees have skills to facilitate implementation of customs integration					
There resources to support implementation of customs integration					
Employees are competent to support implementation of customs integration					
There is technology to facilitate customs integration					

THANK YOU FOR FILLING THE QUESTIONNAIRE

ACKNOWLEDGEMENTS

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Municipalities Elections and the Participation of Youth and Women

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Abstract

Young people under 30 years of age represent about one third of the population, while the percentage is close to half among women, but empirical evidence indicates that the representation and participation rates of these two groups are low. Comparative data indicate that there is a sharp decline in the participation of youth and women in the municipal elections in 2017 compared to the elections in 2012; that there are several reasons behind this decline, including the high rates of consensus lists, in addition to the low percentage of party lists, and the low participation rates in voting.

The study contributes to clarify the impact of many independent variables not addressed in previous studies on the participation of youth and women because of the specificity of these factors in the Palestinian case, such as lists of consensus or circles that were not nominated as they are still under direct political and administrative control by the Israeli Occupation; hence all these factors are unique to the Palestinian situation, which gives this research study a great theoretical significance.

Key Words: *Youth participation. Municipality election Palestine 2017. Consensus list. Voting, occupation.*

Introduction

The Council of Ministers issued on January 31, 2017 a decision requesting all local municipalities to hold elections in all locations on May 13, 2017. About 700 thousand voters who are 18 years old and registered on the voters list where they have been residents for at least six months, elected 3,849 members of local government councils in West Bank.

The local councils held the elections according to the proportional system in the West Bank only because of the split, and 326 local councils out of 391 participated in these elections. Later on, the Council of Ministers issued another decision to hold supplementary local elections on July 29, 2017, in which 32 local councils participated. This study seeks to examine the impact of the electoral system on the participation of both youth and women in Palestine, who are considered marginalized.

Political environment:

There are two main factors that influence the process of local elections in Palestine. The first is linked to the political split between Fatah and Hamas since 2007, which led to the division of Gaza under Hamas' rule and the West Bank under Fatah's rule. The second factor is the Israeli occupation, which led the Palestinians to lose hope in having peace. In light of this vision, Israel has built an isolation wall, between the Palestinian and Israeli areas, following the second intifada. It is designed to capture more than 65% of the water resources in the Palestinian territories. When the wall is completed, it is expected that the percentage of Palestinian land being

swallowed up within the Israeli territory will reach 9.4% (B'Tselem, 2011, p. 46). On another-note, since 1993, Israel has doubled the number of settlers in the territories of the Palestinian National Authority to more than half a million settlers, in violation of the International Law and mutual agreements between the Israeli and Palestinian sides. Finally, the occupation policies have burdened the Palestinians, weakened their local economies and contributed to the spread of high levels of poverty and unemployment. In this context, the economic loss of the Palestinian economy is estimated directly and indirectly as a result of the continued Israeli occupation to the Palestinian territories to be \$ 6897 billion, which is equivalent to 93.3% of the GDP of the Palestinian economy in 2010 (Ministry of National Economy, and the ARIJ Institute, 2011, p. 1-2).

According to previous analysis, the level of democracy in Palestine has decreased between 2006 and 2012. Palestine changed from a “flawed democracy” in 2006 to a “hybrid regime” in 2012 (Olof Palme International Center ‘n.d). According to Freedom House, (2018) Palestine converted to a no-free region after the split.

President Abaas issued on January 9, 2017, a decree by law amending the Local Elections Law by which the Elections Court was formed to adjudicate elections’ appeals instead of the Court of First Instance. In addition, the Palestinian cabinet in the West bank called for a new local election in January 2017 (Central elections commission, 2017, p. 13). Thus, the Palestinian Authority's cabinet chose in May 2017 the elections to be held in the West Bank and postponed the elections indefinitely in Gaza Strip. The Municipalities’ elections are conducted under Law (5) of the 1996 Election Law for Local Councils (with amendments passed in 2004, 2005 and 2012) (International Foundation for Electoral Systems, 2017).

Elections have been called for 391 councils: 116 municipal councils and 275 village councils. However, polling was held only in 145 councils. In 181 councils, only a single electoral list was registered so the seats were awarded without polling. In 65 councils, no list was registered, which meant that the mandate of the current council was extended until the next round of local elections (International Foundation for Electoral Systems, 2017).

The study problem

Youth under the age of 29 represent about one-third of the population, while the proportion of women is close to half. Empirical evidence indicates that the representation and participation rates of these two groups are low. Comparative data indicates that there is a sharp decline in the participation of youth and women in the municipal elections during 2017 compared to 2012. In the 2017 elections, women and youth won the following percentage of seats: 21.1% and 37% respectively, compared to 21.5% and 50% respectively in the 2012 elections. Jaffal (2017) points out that there are several reasons behind this decline, which include the increase in the consensus lists to reach 199 lists, in addition to the decline of party lists which only reached 35% of the total lists. Jaffal also demonstrates that this decline is attributed to the decrease in participation rates of the votes to about 53.4%. Another study by Odah (2016) indicates additional reasons that contributed to this decrease in the political participation of youth, which included the spread of poverty and unemployment amongst youth, and the political division and occupation. The Youth Survey (2016) showed a sharp decline in the participation rates of youth and women in political parties demonstrated by the low percentages of 1.4% and 0.3% respectively. On another note, the study by Odah (2017) and Mathewson (2014) indicates a negative relationship between exercising democracy and the occupation in Palestine. In this context, the elections that take place in Area C are directly subject to the Israeli repressive measures of arrest, threat and/or disruption, which affects the participation of youth and women in the elections in these areas. This study raises an important issue that revolves around an important central question, namely, the impact of the use of the proportional electoral system on the low participation rates of youth and women in the municipal elections of 2017 whether by voting or representation.

Literature review

The electoral systems convert the number of votes obtained for each party/candidate according to the preferences of the voters to a number of seats in the parliament, which is divided according to the electoral formula of the proportional representation systems (PR),

the majority/pluralism systems, the mixed system, the convertible sound system, and the alternative sound system of the electoral formulas (Blais and Massicotte, 1996). According to Reynolds (1996, p.194-196), there are a number of advantages offered by the proportional systems, such as a fair representation for all different social groups, including women and youth. However, in some cases as what is explained in the contagion theory, which suggests that traditional parties will feel pressured to nominate more women or youth if one of their political rivals; starts to promote the representation of women or youth. It is important to distinguish between macrocontagion and microcontagion. In their article, Matland & Studlar (1996) argue that microcontagion is more likely to occur in party list proportional representation systems than in single-member district systems.

In the local elections in Nigeria, Olutayo & Adebayo (2017) point to the active participation of women in electoral politics, mainly as voters and support staff. Despite this participation, women are not rewarded with positions of political power in political parties. Therefore, the authors recommend that political parties and legislative gender quotas should be adopted to immediately enhance the attempt of women at becoming political actors.

Matland (2005) finds that there is no guarantee that the (PR) system will lead to an immediate increase in women's representation or women's participation. However, research indicates that it is just a step in the right direction to increase women's or youth's political participation. Previous studies indicate that not any (PR) system will work well to guarantee sufficient youth and women's representation. On the contrary, the author stresses that some types of PR systems are favored compared to others systems.

Jaffal (2017) indicates several important aspects that characterize these elections such as the low percentage of voting in the elections, the increase in the number of local municipalities that could not form any electoral lists, the increase in the consensus lists, and last but not least, the weak relation between the proportional electoral system and the low voting rates in the elections. The author highlights various reasons to explain this, these include the political division, the weakness of the institutionalized party, the polarization within Fatah movement, in addition to the strength of tribal affiliation. In contrast, Mansour (2015) argues that the (PR) system has contributed to the rise of the percentage in the consensus lists.

Previous Studies differed in determining the trends of cohesion and sustainability of Foreign Imposed Democracies (FID). Whitehead (1996) finds a positive relationship between the occupation and the sustainability of (FID). Enterline and Greig (2010) and Downs and Monten (2013) link between the environmental factors such as the economy and ethnic division, negative past experiences, negative culture, proximity, leadership and institutions, and the sustainability of (FID). Mathewson (2013) finds that the sustainability of (FID) is linked to the existence of external threats and the occupation margin value. In contrast, the results of the study by Meernik (1996) and De Mesquita and Downs (2006) do not match the results of previous researches that show a positive relationship between the occupation and the sustainability of democracies imposed from abroad.

In this context, the theory of electoral systems assumes that the proportional electoral system (PR) is more suitable for increasing the participation of women and youth in the elections. However, it is shown that the Palestinian municipal elections of 2017 that followed the (PR) system were accompanied by a clear reduction in youth and women's participation. The study proposes the (FID) theory to explain the decline in youth and women's participation, in which the Israeli occupation in general, and its increased control on areas (C) in particular, led to reducing the electoral participation of women and youth to a large extent that cannot offset the positive and stimulating effects of the use of the (PR) system.

The main objectives of the study

1. To determine the implications of the participation rates of women and youth in terms of registration, voting, nomination and representation in the municipal elections of 2017 compared to the previous municipal elections.

2. To examine the relationship between the participation of youth and women in the municipal elections of 2017 in the lists of the consensus, the bodies that did not run any list, the place of residence (rural, city), the party lists, and the Israeli occupation.

Description of the study:

The study proposes a different framework to study the impact of the electoral systems on the electoral participation of women and youth. While most of the literature discussing the electoral systems assume that there is a positive relationship between the propositional electoral systems (PR) and the political participation of marginalized groups in the elections, including women and youth, this study borrows from the literature of Foreign Imposed democracy (FID) an important result which is the existence of a negative relationship between the occupation and the sustainability of democracy. Additionally, the study argues that the negative impact of the occupation on the indicators of democracy including the participation in the electoral process varies depending on areas that are under direct control of the occupation. Moreover, the proposed framework depends on the combination of several variables in the theory of (FID), namely the nature of military control of the occupation, the degree of urbanization in these areas, and the number and nature of the competing lists under the proportional electoral system. Hence, the study argues that the Israeli occupation has played a negative role in weakening the participation of youth and women in the Palestinian municipal elections, and that the negative role was much greater than the positive impact of the (PR) on the participation of women and youth in the local elections in 2017.

The importance of the study

- 1- The participation of women and young people in the Palestinian municipal elections is increasingly reduced; as was clearly indicated by the results of the local elections in 2017. One of the explanations suggested by the study is the existence of a large number of local bodies under direct military control of the Israeli occupation (Area C) (275 local bodies from 391). The study also suggests to get rid of the occupation, which will contribute to enhancing the participation of youth and women in the Palestinian territories and thus promoting the sustainability of democracy.
- 2- The study contributes to clarifying the effect of many independent variables, which were not studied before, on the participation of youth and women. One reason as to why such variables were not studied is explained by the lists of constituencies that did not present any list or district since they are under the direct political and administrative control of the occupation. All of the reasons mentioned earlier are unique to the case of Palestine, which makes the research of great importance at the theoretical level.
- 3- Based on what was mentioned earlier, the results of this study will contribute to bridging the debate over the feasibility of changing the electoral system in the municipal elections in Palestine, and examining whether another electoral system can be designed to increase the participation of women and youth taking into consideration the characteristics of the Palestinian society such as occupation, division, family, and the weakness of the political parties.

The methodology of the study:

The study uses quantitative and qualitative methods to answer the study questions. Through the quantitative approach, and to be able to examine the first objective, the study uses the numerical data of the results of the municipal elections prepared by the Central Election Commission and works on providing a statistical comparison between the participation rates of women and youth in various municipal elections for the years 2004-2005, the 2012 elections, and the 2017 elections. Additionally, the study explains these results and clarifies their implications. Quantitative and qualitative analysis is also used to examine the second objective of this study. The statistical data from the 2017 municipal elections prepared by the Central Elections Commission will be used; the study sample is the whole study population, which is 461 municipal elections. The results are then analyzed where youth and women's participation are the dependent variable, and the independent variables are the lists of compatibility, the bodies in which no list was drawn, the place of residence (rural, city), the party lists, and the Israeli occupation and area C. The analysis will be done using the SPSS program. Finally, the study will conduct two focus groups, each involving 12 participants from different sectors of youth and women, in order to explain the relationship between the dependent factor and the independent factors, and to describe it correctly and in line with the quantitative results.

Percentage of youth in the lists of registrants:

The Central Election Commission records show that the percentage of males registered in the election records is two percentage points higher than that of females (51% males, 49% females), On the other hand, the records show that the percentage of females in the electoral register among the younger generation exceeds males (19% females, 18% males). See Table 1.

Table (1): Numbers and percentages of youth in the electoral registers

Total no. of voters	No. of males	% of males	No. of females	% of females	Total no. of youth aged 18-30	% of youth aged 18-30	No. of registered males aged 18-30	% of males aged 18-30	No. of registered females aged 18-30	% of females aged 18-30
805482	410164	51%	395318	49%	295596	37%	146267	18%	149329	19%

Percentage of youth in the lists of voters:

Voter records show that the proportions of male voters of all age groups converged with those of young male voters. The same applies for females, see Table 2.

Table (2): Percentage of youth in the lists of voters

Percent of males	Percent of females	Percent of youth aged 25-30		
		%	Percent of males	Percent of females
57.23%	42.77%	35.53%	57.25%	42.75%

Elections of the local authorities have rarely been repeated in this way, as voters from all categories converged with those of young people, but what is striking is the low turnout of women in comparison to men of all ages, where the difference between them was about 14%, which is rather large.

Percentage of young candidates in all lists of sponsorship/endorsement and competition (325 bodies)

No more than 1015 (17%) of the youth candidates were able to reach their local councils, either by endorsement or competition, including 12% of males and 5% of females. This does not reflect their size in the electoral register, but much less. See the table below.

Table (3): Percentage of young candidates in all lists

Total	Males	Females	Total 25-30	% youth	Males	% male youth	Females	% female youth
6094	4486	1608	1015	17%	737	12%	278	5%

Percentage of youth winners

Table (4): Percentage of youth winners

Total	Males	Females	Total 25-30	% youth winners	Males	% male youth winners	Females	% female youth winners
3235	2550	685	312	10%	221	71%	91	29%

The results show that there are significant differences between males (71%) and females (29%) of youth winners. The proportion of young women winning is greater than that established by law.

Description of the registered sample

Table (5): Description of the registered sample

No. of registered female youth	No. of registered male youth	No. of registered females	No. of registered males	Total no. of registered sample	Total no. of registered youth	
1029.8552	1008.7379	2726.3310	2828.7172	5555.0483	2038.5931	Mean
48.00	59.00	128.00	153.00	281.00	115.00	Lower limit
14000.00	13092.00	36321.00	39261.00	74893.00	27092.00	Upper limit

Voter records show that the number of registered females is higher than that of males at both the general and youth levels.

Correlation between registrations and regions

Table (6): Correlation between registered numbers and regions by urbanity and authority areas

		Total no. of registered individuals	Total no. of registered youth	Area (C)	Urban areas
Total no. of registered individuals	Pearson Correlation	1	.997	-.063	-.352
	Sig. (2-tailed)		.000	.449	.000
	N	145	145	145	145
Total no. of registered youth	Pearson Correlation	1.000	.997	-.063	-.349
	Sig. (2-tailed)	.000	.000	.455	.000
	N	145	145	145	145
Area (C)	Pearson Correlation	-.063	-.070	1	.118
	Sig. (2-tailed)	.449	.400		.159
	N	145	145	145	145
Urban areas	Pearson Correlation	-.352	-.356	.118	1
	Sig. (2-tailed)	.000	.000	.159	
	N	145	145	145	145

Total registered individuals according to the areas of the National Authority

Table (7): Correlation between registered numbers and regions by urbanity and authority areas

Areas		Cases					
		True		Error		Total	
		No.	Percent	No.	Percent	No.	Percent
Total no. of registered individuals	Areas (A/B)	141	100.0%	0	.0%	141	100.0%
	Area (C)	4	100.0%	0	.0%	4	100.0%
Total no. of registered youth	Areas (A/B)	141	100.0%	0	.0%	141	100.0%
	Area (C)	4	100.0%	0	.0%	4	100.0%

The elections were held in 145 local councils, including 141 local councils in Areas (A/B) under the Palestinian Authority in terms of security and administration, and 4 were held in Area (C) which is under the authority of the Israeli Occupation.

Total registration depending on urbanity:

Table (8): Total registration depending on urbanity

Area by Urbanity		Cases					
		Valid		Missing		Total	
		No.	Percent	No.	Percent	No.	Percent
Total no. of registered individuals	Municipalities	86	100.0%	0	.0%	86	100.0%
	Rural Councils	59	100.0%	0	.0%	59	100.0%
Total no. of registered youth	Municipalities	86	100.0%	0	.0%	86	100.0%
	Rural Councils	59	100.0%	0	.0%	59	100.0%

Elections were held in 145 local councils including 86 municipalities out of 114 municipalities and 59 village councils out of 211 village councils. These figures show that about 60% of municipalities witnessed competition among voters, and the rest was by consensus, while only 28% of village councils saw competition among candidates.

Number of registered individuals and urban areas (t-test)

Table (9): Number of registered individuals and urban areas (t-test)

Area by Urbanity		Statistic	Bootstrap ^a				
			Bias	Std. Error	95% Confidence Interval		
					Lower	Upper	
Total no. of registered individuals	Municipalities	N	86				
		Mean	8337.4070	-61.6467	1211.2638	6144.3170	10793.7572
		Std. Deviation	11668.04617	-628.04425	3053.25250	4838.75415	16615.89458
		Std. Error Mean	1258.19778				
	Rural Councils	N	59				
		Mean	1499.4068	-1.9450	85.8045	1321.4936	1664.5834
		Std. Deviation	642.39471	-8.44037	53.90313	532.85499	737.16647
		Std. Error Mean	83.63267				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

t-test:

t-test for Equality of Means				
		T	df	Statistical significance
Total electoral	Equal variances assumed	4.492	143	.000
	Equal variances not assumed	5.423	85.750	.000

There is a statistical value of 0.000. This shows that there is a statistical relationship between the number of registrars and urban areas. When comparing the average between the two areas, we found that the average number of voters in the municipalities is 8337, which is higher than the average number of voters in the village councils of 1499. This means that the number of registrants is higher in the municipalities.

Relationship between young candidates with competition (Elected Lists/Endorsement Lists)

Table (10): Relationship of young candidates and competition

Means of competition		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth candidates aged 25-30	Elected	144	3.50	4.112	.343
	Consensus	177	2.81	3.949	.297

t-test:

t-test for Equality of Means		
Total no. of youth candidates aged 25-30	Equal variances assumed	.129
	Equal variances not assumed	.131

The above tables show that the average number of young candidates in the elected lists, which is 3.50, is greater than the average number of young candidates in the consensus lists, which is 2.81. This indicates an increase in the proportion of young candidates in the competition lists. However, the relationship is not statistically significant because the t-test had a significance result of 0.129, which is higher than 0.05.

The Relationship between young candidates with the region under Palestinian Control

Table (11): Relationship of young candidates per the region

Areas under Palestinian authority		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth candidates aged 25-30	Areas (A/B)	288	3.18	3.975	.234
	Area (C)	33	2.58	4.521	.787

Independent samples test:

t-test for Equality of Means		
Total no. of youth candidates aged 25-30		Statistical significance
	Equal variances assumed	.412
	Equal variances not assumed	.463

The above tables show that the average number of young candidates in Areas (A/B) is 3.18, which is higher than the average number of young candidates in Area (C), which is 2.58. This indicates an increase in the percentage of young candidates in Areas (A/B), but this is not statistically significant because the t-test had a significance of 0.412 which is higher than 0.05.

The relationship between young candidates with urban areas

Table (12): Relationship of young candidates with the urban areas

Urban Area		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth candidates aged 25-30	Municipalities	110	3.65	4.388	.418
	Rural Councils	211	2.84	3.813	.263

Independent samples test:

t-test for Equality of Means		
Total no. of youth candidates aged 25-30		Statistical significance
	Equal variances assumed	.087
	Equal variances not assumed	.102

The above tables show that the average number of young candidates in the municipalities, which is 3.65, is greater than the average number of young candidates in the municipal councils, which is 2.84. This indicates an increase in the proportion of young candidates in the municipalities, however, the relationship is not statistically significant because the t-test result had a significance of 0.087 which is higher than 0.05.

The relationship between the number of youth winners with the manner of competition

Table (13): Relationship of the number of youth winners with the manner of competition

Manner of competition		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth winners	Elected	144	1.02	1.125	.094
	Consensus	177	.89	1.150	.086

Independent samples test:

t-test for Equality of Means		
Total no. of youth winners		Sig. (2-tailed)
	Equal variances assumed	.317
	Equal variances not assumed	.316

The above tables show that the average number of young winners in the elected lists, which is 1.02, is greater than the average number of young winners in the consensus lists, which is 0.89. This indicates an increase in the percentage of young winners in the competition lists, but the relationship is not statistically significant because the t-test value of 0.317 is higher than 0.05.

Relationship between the number of young winners in the regions under Palestinian control

Table (14): Relationship between the number of young winners in the regions under Palestinian control

Area		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth winners	Areas (A/B)	288	.92	1.097	.065
	Areas (C)	33	1.21	1.453	.253

Independent samples test:

t-test for Equality of Means		
Total no. of youth winners		Statistical significance
	Equal variances assumed	.163
	Equal variances not assumed	.271

The above tables show that the average number of young winners in Areas (A/B), which is 0.92, is less than the average number of young winners in Area (C), which is 1.21. This indicates an increase in the percentage of young winners in Area (C). This, however, is not statistically significant because the t-test value with a significance of 1.63 is higher than 0.05.

The relationship between young winners with urban areas

Table (15): Relationship of young winners with urban areas

Area		N	Mean	Std. deviation	Mean of std. deviation
Total no. of youth winners	Municipalities	110	1.14	1.185	.113
	Rural Councils	211	.85	1.105	.076

Independent samples test:

t-test for Equality of Means		
Total no. of youth winners		Statistical significance
	Equal variances assumed	.034
	Equal variances not assumed	.039

The above tables show that the average number of young winners in the municipalities, which is 1.14, is greater than that in the village councils, which is 0.85. This indicates a high percentage of young winners in municipalities. This result is statistically significant because the t-test has a significance value of .034 which is less than 0.05.

The relationship between young candidates with the size of the unit

Table (16): Relationship of young candidates with the size of the unit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.304a	.092	.089	3.827

a. Predictors: (Constant), unit size.

ANOVA ^b						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	480.682	1	480.682	32.826	.000 ^a
	Residual	4729.761	323	14.643		
	Total	5210.443	324			

a. Predictors: (Constant), unit size.

b. Dependent Variable: total no. of youth aged 25-30.

The above tables indicate that there is a weak direct correlation between the number of young candidates and the size of the unit, where R Square value was 0.92, with a statistical significance of .000.

The relationship between young winners and the size of the unit

Table (17): Relationship of young candidates with the size of the unit

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.142a	.020	.017	1.129

a. Predictors: (Constant), unit size.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1	(Constant)	1.990	.405		4.911	.000
	Size of unit	-.104	.040	-.142	-2.573	.011

a. Dependent Variable: total no. of youth winners

The above tables show that there is a weak direct correlation between the number of young winners and the size of the circle whereby R Square value reached 0.020 with a statistical significance of .000.

Relationship between the number of female winners in the areas under Palestinian control

Table (18): Relationship between the number of female winners in the areas under Palestinian control

Area		N	Mean	Std. deviation	Mean of std. deviation
Total no. of female winners	Areas (A/B)	289	.25	.479	.028
	Area (C)	33	.52	.667	.116

Independent samples test:

t-test for Equality of Means		
Total no. of youth female winners		Statistical significance
	Equal variances assumed	.004
	Equal variances not assumed	.032

The above tables show that the average number of young women winners in Areas (A/B), which is 0.25, is lower than that in Area (C), which is 0.52. This indicates an increase in the percentage of young women winners in Area (C) with a statistically significant relationship of 0.04.

Relationship between the number of young female winners and urban areas

Table (19): Relationship between the number of young female winners and urban areas

Urban Area		N	Mean	Std. deviation	Mean of std. deviation
Total no. of female winners	Municipalities	110	.26	.482	.046
	Rural Councils	212	.28	.520	.036

Independent samples test:

t-test for Equality of Means		
Total no. of youth female winners		Sig. (2-tailed)
	Equal variances assumed	.745
	Equal variances not assumed	.739

The average number of young female winners in municipalities, which is 0.26, is slightly lower than the average number of young female winners in village councils, which is 0.28. This indicates an increase in the percentage of young female winners in village councils. However, the relationship between the two variables is not statistically significant because the t-test value of 0.745 is less than 0.05.

The relationship between the number of young female winners with the manner of competition

Table (20): Relationship between the number of young female winners with the manner of competition

Manner of competition		N	Mean	Std. deviation	Mean of std. deviation
Total no. of female winners	Elected	144	.21	.424	.035
	Consensus	178	.33	.560	.042

Independent samples test:

t-test for Equality of Means		
Total no. of youth female winners		Sig. (2-tailed)
	Equal variances assumed	.030
	Equal variances not assumed	.026

The above tables indicate that the average number of young female winners in the elected lists, which is 0.21, is slightly lower than that in the consensus lists, which is 0.33. This indicates the high percentage of young female winners in the consensus lists. Nonetheless, the relationship between the two variables is not statistically significant because the t-test value of .030 is less than 0.05.

The relation between the percentage of young voters with the youth winning

Table (21): Relation of the percentage of young voters

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.183a	.034	72.0	4.640

a. Predictors: (Constant), total no. of winning youth

ANOVA ^b						
	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	106.406	1	106.406	4.942	.028 ^a
	Residual	3057.392	142	21.531		
	Total	3163.797	143			

a. Predictors: (Constant), total no. of winning youth

b. Dependent Variable: percent of voting youth aged 18-30

The above tables show that there is a weak relationship between the percentage of youth voting and the number of young winners, whereby the value of R Square was 0.34 and within a statistical significance level of 0.028.

Summary of results:

The study reached the following main conclusions:

- 1- The number of young candidates is increasing in the elected lists compared to the consensual lists. These numbers are also increasing in Areas (A/B) of the Palestinian National Authority and are decreasing in Area (C). The number of young candidates is also increasing in the municipalities and decreasing in the village councils.
- 2- The number of winners of youth is increasing in the elected lists compared to the consensus ones and in the municipalities. In contrast, the number of winners is also increasing in Area (C) and is decreasing in Areas (A/B), contrary to the expected, although the number of young candidates in Areas (A/B) is on average higher than the number of young candidates in Area (C).
- 3- The number of young female winners is increasing in the consensual lists compared to the elected lists, and in village councils compared to the municipalities. The number of young women winners is also higher in Area (C).
- 4- The larger the number of units (i.e. the larger number of seats), the more young candidates there are, and the more youth winners.
- 5- The larger the number of units (i.e. the larger number of seats), the more youth winners.
- 6- The number of young winners increases as the percentage of voting youth increases.

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Possibilities for the innovative IT database technology utilisation for the traffic induced seismicity affecting historical buildings in Slovakia

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Abstract- The aim of research paper is to describe approach to determine the dynamic response of reference historical buildings in Slovakia due to transport involved microtremor by theoretical and experimental way. The dynamic analysis results of the reference historical structures include in the universally accessible database. Summarize standardized criteria for microtremor traffic effect on the historic buildings abroad and for Slovakia region to establish a basis for their assessment criteria as specified group of buildings. Determination of seismic resistance to the effects of traffic seismicity.

Index Terms- historical building, random vibration, technical standards, technical seismicity

I. INTRODUCTION

This article is focused to the possibilities for the innovative IT database technology utilisation for the traffic induced seismicity affecting historical buildings. In according the research outputs it is necessary to express a scientific goals for the researcher team. Several topics must be solved:

1. Creating a universally accessible database of historic buildings with the assumption of harmful effects from traffic induced vibrations (reference buildings).
2. On the experimental and theoretical analyzes basis to create assessment system for traffic vibration effect on historic buildings in Slovakia.
3. Application of the results in the creation of relevant standards background regarding the evaluation of traffic vibration seismic effects on the historic buildings in Slovakia.
4. Identify vibration levels effects on humans in structures and design reduction through passive vibro-isolation.
5. To determine the seismic resistance of critical parts of historic buildings due to traffic seismicity experimental way.

The research task can be realized with team composed of members of the Department of Structural Mechanics, Faculty of Civil Engineering University of Žilina and its laboratory.

Department has a long and high position in structural dynamics and experimental methods field. From the Faculty of Civil Engineering of University of Žilina, the team is also complemented by a researcher from the Department of Building Engineering and Urban Planning as the experts in historical buildings. From the point of view of the security engineering, a researcher from the Faculty of Security Engineering of the University of Žilina is included in the group.

The collective is balanced staff composition for experimental measurements as well as for FEM simulations and technical support.

II. STATE OF ART IN SLOVAK REGION

The assessing of seismic effect due to traffic is addressed in current standard EC8. Whereas the technical standards are recommendatory naturally, civil engineering practice currently uses also repealed standard STN 73 0036 " Seismic actions on structures."

Nowadays the important scientific papers domestic and international presents main objectives to evaluate the dynamic response of structures due to seismic effects.

In the Czech Republic (Slovak Republic near region) the with problems of seismicity and structural dynamics deal respected scientists as J. Máca, M. Pirner, M. Polak and J. Náprstek. From Slovakia is one of the leading scientists who contribute the development of traffic seismicity engineering J. Benčat. Other important scientists in Slovakia which are interesting in seismicity are A. Tesár, J. Králik, N. Jendželovský, M. Sokol. Based on the scientific work and international standards study the evaluation of historic buildings dynamic response is needed in Slovakia.

Also there is no elaborated concept of vibro-isolation and definition of seismic resistance from traffic seismicity.

III. PARTICULAR CONTRIBUTION EXPECTED

The absenting statistics about the number and structural conditions of historic buildings in the risk of traffic seismicity damage, it is necessary to solve this problem. Expected contribution of the research is to fill the area in which the need to define the current state of historic buildings in cooperation with the Monuments Board of the Slovak Republic and the Municipalities.

The main anticipated contribution of the research includes:

- Development of methodology for evaluation of historic buildings in Slovakia dynamic loaded caused by traffic seismicity.
- Definition - linear transfer characteristics in a dynamic interactive process of road transport system – the existing structure
- Development of a predictive models for assessing the traffic increase and its impact on the existing historic buildings in Slovakia
- The creation of universally accessible electronic database of historic buildings threatened by traffic seismicity
- Use database engineering practice, public institutions, managers and owners of historic buildings
- Based on experimental and simulation analyzes of reference historical buildings to create basis for solving the technical criteria for assessing the effects of traffic seismicity
- Experimentally identified seismic resistance of critical parts of historical buildings will help in defining the limits of the effects of traffic seismicity.

IV. PROPOSAL HOW TO REACH THE RESEARCH GOALS FOR FUTURE FOR SLOVAK SCIENCE

Proposal of the research ways is to reach the research goals, including timetable for each individual year of research:

A. *First part of solution*

- Summarizing the evaluation criteria for the traffic effects seismicity assessment of the historic buildings in foreign literature and standards
- Selection of the historic buildings at risk from the traffic effects seismicity due to as reference structures
- Creation of computational models of reference structures, simulations in the time and frequency domain, extrapolation of the results solutions for increased traffic
- Experimental measurements of the reference structures and evaluation
- Preparation of seismic resistance experiments in the theoretical area
- Publishing partial results of the research and the confrontation with the scientific community

B. *Second part of solution*

- The computational models of reference structures debugging, simulations in the time and frequency domain, extrapolation of the results solutions for increased traffic
- Comparison of experimental measurements and simulations for the reference structures and processing their results
- Creation of an electronic database of historic buildings threatened by traffic seismicity

- Realization of seismic resistance experiments on small-dimensional models of critical parts of historical buildings
- Publishing partial results of the research and the confrontation with the scientific community

C. *Third part of research - outputs*

- Implementation of a database with the results of analyzes of reference structures - run test operation of the database
- Implementation the analysis results to the database – open for engineering community - run the full operation of the database
- Realization of seismic resistance experiments on full scale critical parts of historical buildings
- Publication of the research results and confrontation with the scientific community

V. DESCRIPTION OF APPLIED METHODS AND THEIR EXPLANATION

Using methodologies for research processing for the reference buildings are follows:

1. establishment of criteria for the building risk classification due to traffic seismicity by basic parameters: age of the structure, structural system, structural materials, structure geometry, distance from traffic line, traffic intensity, technical condition of transport routes
2. creation of a global, or plane (spatial) FEM computing model of structure, the dynamic calculation on FE modeling the frequency and time domain
3. Preparation and realization of experimental measurements, evaluating the results in frequency and time domain, verifying and debugging of structure FE model
4. realization of dynamic calculation for predictive situation in degraded conditions: an increased traffic, decreased traffic road quality, buildings decreased technical parameters
5. create a database of historic buildings threatened by traffic seismicity using PHP script, setting up a central server, creating the system database, opening the system database
6. Analysis of the evaluated structures for assessment evaluation criteria for historic buildings based on the results included in the database

Additional research phases will complement and expand the database of assessed buildings.

In parallel with the first phase of the research, research will be carried out on the seismic resistance and efficiency of vibro-isolation systems designed to reduce the effects of traffic seismicity.

VI. RANDOM PROCESS EVALUATION OF TRAFFIC SEISMICITY BACKGROUND

In the theory of random processes, it is possible to formulate general conclusions on the load, the response of the structure, and their dependence in the dynamic investigation of building structures. A random phenomenon - it is a phenomenon whose occurrence cannot be predicted, even if a certain set of conditions is anticipated. This random phenomenon is related to the load and response of the structure and its dependence. It does not resolve the case conditions. A random quantity - is the most common description of a random event. If all the circumstances are known, it can gain unexpected numerical values. We divide the quantities into discrete and continuous random quantities. The discrete random quantity includes the sum of the range of values. The continuous random quantity includes the interval on the real axis. The random function - is a random function whose execution has a functional course, not a value. The random process - is a process of non-periodic function of one parameter such as time (t). We can only determine it by probability.

The Random Process Theory deals with the study of a random variable dependent on a continuously variable parameter. The processes are divided into deterministic and stochastic. Deterministic processes have a defined added value of excitation force over the entire time interval. The vector of excitation forces defines a set of known functions over time. The system periodically repeats itself in a certain period of time. If the system repeats itself, it is a periodic system, if it is not repeated, it is a non-periodic system. Stochastic processes have defined factors that characterize oscillation as a random function of time. For this process, the time course of the characteristics is unpredictable. They are divided into stationary processes and non-stationary processes. Random processes can be characterized in the following areas: time, correlation, frequency, spectrum, probability, and information.

VII. STATE OF ART IN APPLICATION FIELD

The increase in vibration caused by different modes of transport has an adverse effect on building constructions and man. Also, modern building technology, construction, and design efficiency have raised the challenge of addressing the dynamic response of the construction to the impact of traffic-induced seismicity. The fact that the entire transmission system building construction - geological environment as well as a source of vibration is complex, leads to a stochastic event. Since the dynamic load, in this case, causes a response with the stationarity property, it is possible and practical to divide this task into partial tasks (vehicle-track, geolocation transmission ...). At present, we can notice a sharp increase in the intensity of especially road transport, both passenger and freight, as well as streamlining and accelerating rail transport. This also increases the effects of technical seismicity on buildings. Among the buildings that are built in close proximity to the transport routes are also bridge structures, because it is in the interest of transport safety to build split level junctions.

Vibrations represent the movement of a flexible body or environment whose individual points vibrate mechanically. In

mechanical oscillation, this is a physical phenomenon, with a point or rigid body reaching different positions in space over time so that they move within a certain range of distances that do not exceed, around the so-called. equilibrium - middle position. The number of full cycles of oscillation in 1 second is called frequency (frequency) and is expressed in Hertz (Hz).

The main causes of vibration by road or rail transport are dynamic forces entering through the vehicle's contact with the track to the subsoil, geological environment, to buildings and the surrounding environment. Their spread can reach a few hundred meters. The moving vehicle creates vibrations with its own oscillation, component manufacturing inaccuracies, and moving parts. Another reason may be the imbalance of vehicle components with rotating, oscillating, swinging and reciprocating movements or the contact of the components with friction and rolling. The size and the vibration intensity, is, besides the type, weight, and speed of the vehicle, affected by the technical condition of the road or the railway.

VIII. CONCLUSION

Nowadays, rising intensity of traffic is significant effect on entire world, because the endanger risk of adjacent buildings rises with this effect. Endanger risk is caused by traffic vibrations spreading through the bedrock, i.e. by traffic seismicity. Historical buildings are specific group of structures, which are especially sensitive on traffic seismicity effects, if these structures are exposed to them. That is why these effects are needed to be analyzed.

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Comparative analysis - Innovation initiatives in Malaysia

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Abstract - This conceptual paper explores the state of innovation and factors that need to be implemented and rectified to improve innovation initiatives in Malaysia. Although many initiatives had taken by Malaysia to build and improve the innovation ecosystem in Malaysia, the outcome of innovations in Malaysia is not par with other countries in Asian continent.

Index Terms: innovation initiatives, innovation ecosystem, Malaysia

I. Introduction

According to Narayanan. S and Wah .Y.L (2016), Malaysia had taken initiatives to build and improve its innovation ecosystem. Malaysian government had allocated higher budget for Science and technology, research and development and human resource development. For an instance, the budget allocation for education and training has doubled from 10.1% of total development expenditure in 1981-1985 to 20.6% in 2006-2010 and 2015-2018 is 31.6% It shows Malaysia's effort and commitment to improve its innovation strategies.

Moreover, Malaysia had taken the following initiatives to enhance its innovation strategies such as the incorporation of development of science and technology and research and development into national development plan since 1986. To encourage the private sector participation in innovation, various programmes have been initiated including the grant allocation for their research and development activities, provide support for commercialization of research and development findings, facilitate the purchasing of technology and development of science and technology infrastructure. In recognizing the role of information and communications technology (ICT) in developing innovation strategies the budget allocation for ICT development has been continuously increasing from 2.6% (in 1996-2000) of development expenditure to 6.4% (in 2006-2010) (Hamri Tuah, Devendran Nadaraja & Zakiah Jaafar, 2009).

II. Current state of Innovation in Malaysia

According to the Global Innovation Index (GII) (2019), only three countries from Asian continent remained in the top 20 for year 2019. The three countries that placed in top 20 were Singapore (8th), Hong Kong (13th) and South Korea (11th). Japan was placed at (15th) while Malaysia was (35th). Figure 1.0 shows that Malaysia scores' in human capital, infrastructure, research and development and creative output were relatively lower than other Asian countries such as Hong Kong, Japan, Korea as well as Singapore.

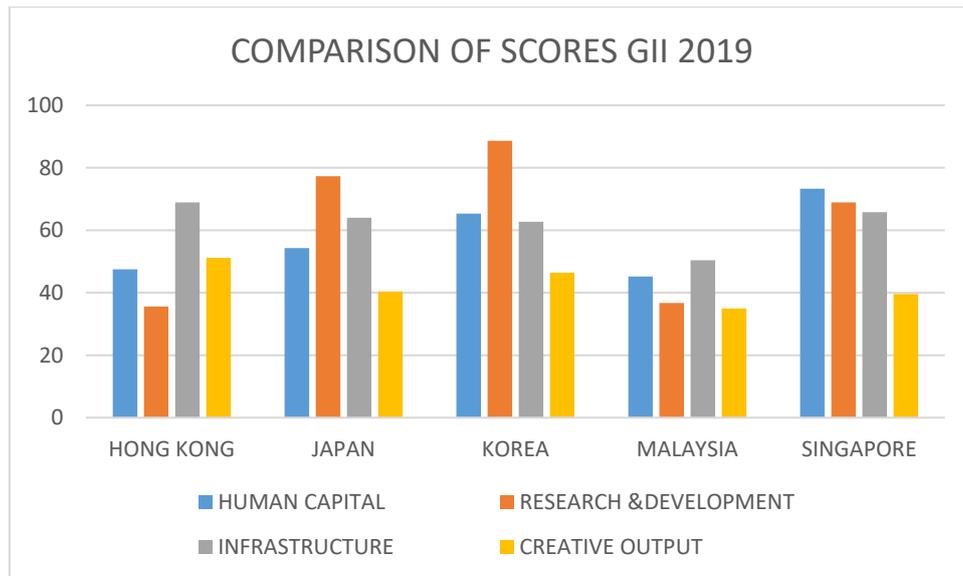


Figure 1.0: The ranking of five countries – Hong Kong (China), Japan, South Korea, Malaysia and Singapore for the year 2019 in human capital, infrastructure, research and development and creative outputs. (Adapted from The Global Innovation Index, 2019)

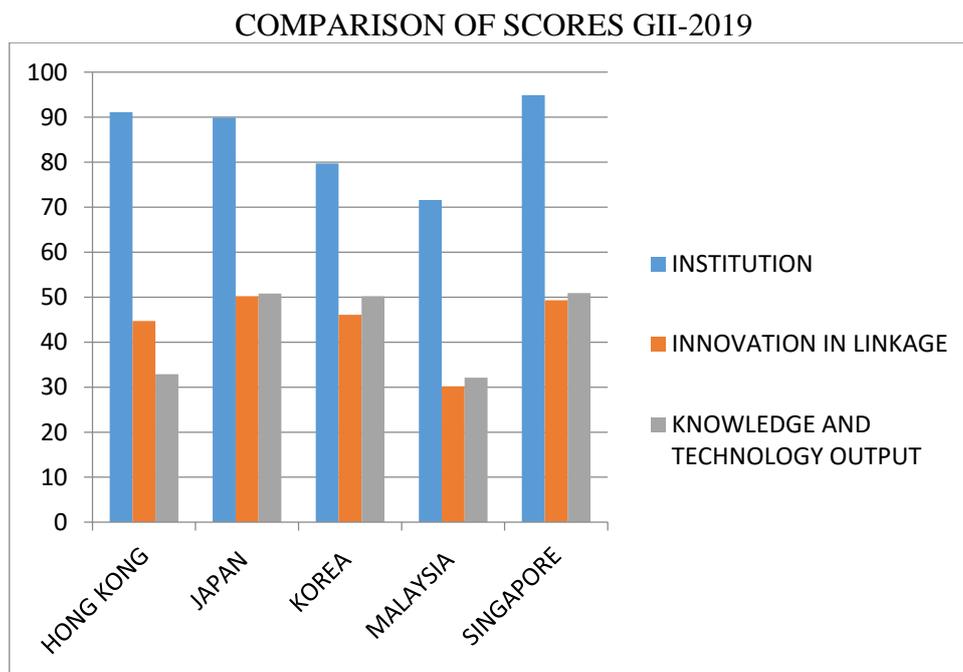


Figure 2.0: The ranking of five countries – Hong Kong (China), Japan, South Korea, Malaysia and Singapore for the year 2019 in institutions, innovation linkages and knowledge and technology outputs (Adapted from The Global Innovation Index, 2019)

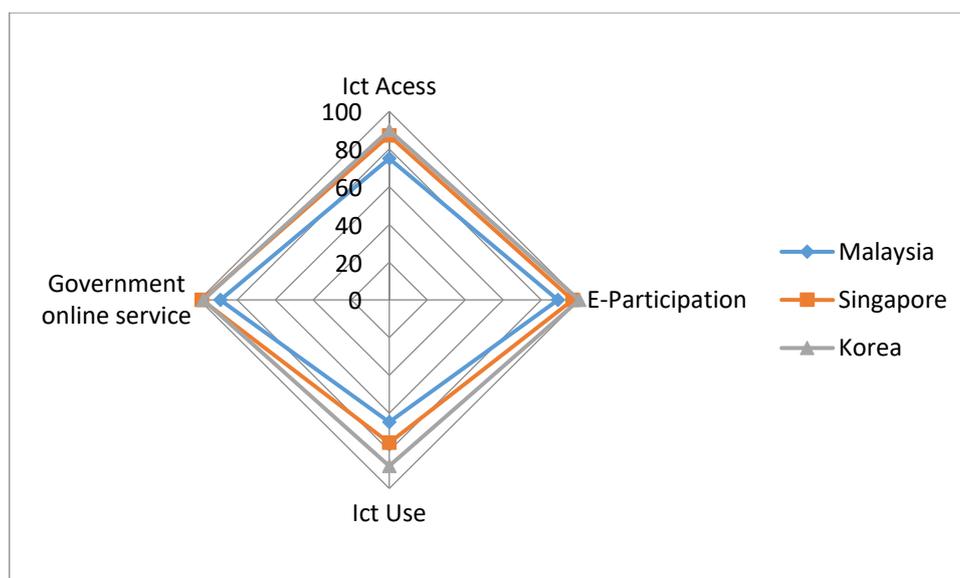


Figure 3.0: Malaysia's performance in the Global Innovation Index (GII) – ICTs Sub pillar (Adapted from The Global Innovation Index, 2019)

By referring to the above graphs (see figure 1.0, 2.0 and 3.0), it is very clear that Malaysia was ranked lowest for all categories that has been selected. Malaysia was trailing behind in all categories or sub categories. The performance in all these main and sub categories determined their overall ranking in GII. In addition to that, Malaysia's effort to improve the usage of ICT also unsatisfactory compared to Singapore or Korea (see figure 3.0). Moreover, MPC (2015) reported that Malaysia was positioned 52nd out of 60 countries in terms of Internet speed and this is far behind compare to Hong Kong or Singapore. Malaysia offered Internet bandwidth speed of 10.65 kbps per user while Hong Kong (1,046 kbps) and Singapore (343.73 kbps). Thus, is Malaysia moving in the right direction in upgrading its innovation capability?

III. Innovation Factors

In the following section, we would discuss some of the innovation factors that Malaysia need to improve in order to be par with its other counterparts in Asia.

A. Innovation, education and training

Malaysian government targeted the development of tertiary education especially in science and technology as one of the major step in acquiring the state of a knowledge-based economy or developed nation by 2020 (Goujan and Samir, 2006). However, the data collected showed that Malaysia still far behind in producing skilled workforce or tertiary educated workforce.

Malaysia and Singapore population with tertiary education is increasing. However, Singapore is leading in this sector. According to OECD (2019), only 47.8% Malaysian labour force in 2019 had tertiary qualification while graduate in science and engineering is 32.1%. According to Mun-Heng (2012), in the same period, 50.3% of the labour force in Singapore had tertiary education qualification. In fact, tertiary education in Singapore is heavily subsidized by the government, in which, tertiary students are required to pay only 30% of actual education cost. OECD (2019) acknowledged that lower level of tertiary educated labour force in Malaysia resulted in shortage of skilled workforce which contributed to weak productivity growth, lack of creativity and innovation in the Malaysian workforce. Singapore, had higher level of tertiary educated workforce.

Rosyati Abdul Rashid and Rosna Awang Hashim (2008) claimed that proficiency in English language is considered as one of the most important criteria for marketable graduate. Furthermore, Rosyati Abdul Rashid and Rosna Awang Hashim (2008) claimed that the introduction of English language as a teaching medium of instruction for the teaching of Mathematics and Science (Pengajaran dan Pembelajaran Sains dan Matematik dalam Bahasa Inggeris - PPSMI) in Malaysian primary and secondary schools beginning year 2003 was initiated

for this very purpose. However, in 2009, PPSMI policy was reverted by then Education Minister after objection from few parties (Chew Chee Khiang, Fauziah Ahmad, Faridah Ibrahim & Chang Peng Kee, 2012). Although many researchers and concerned parents prefer PPSMI it was abolished in ad hoc manner without proper research and prior consultation with parties involved.

Affero Ismail and Noshasni Zainal Abiddin (2014) claimed that effective education and training is essential in producing skilled workforce. Technical and Vocational Education and Training (TVET) will increase employee’s performance, productivity and capabilities. Furthermore, the authors also claimed that by 2020, about 3.3 million jobs will be created, of which 1.3 million will be TVET based. However, the TVET sector would not be able to meet up the demand. Though the student enrolment is increasing since 2001, a few years showed drops in students’ intake as there were budget and quota constraints. Moreover, 70% of TVET current graduates concentrated on lower-level skills or Malaysian Skills Certificates qualification only. Though some of the training and education programmes were affected due to a shortage in budget allocation, the Malaysian government had slashed the budget allocation for education sector from RM56billion in 2015 (BERNAMA, 2015) to RM41.3 billion for 2016 (TheStar Online, 2015).

Malaysia’s initiatives in developing a creative and innovative workforce by improving education and training among Malaysians is still far behind Singapore or even Korea as it failed to upgrade the education status of Malaysian workforce on par with other developed countries such as Singapore. Adequate Budget allocation and proper and through research must be done prior introducing new policies related with education. Decision must be made based on research and statistical data and government should not modify and abolish good policies just to score political points.

B. Innovation and skilled migrants

Singapore encourage skilled employees to obtain permanent residency or acquire Singaporean citizenship while those unskilled employees were only provided short term working permits (Goujan and Samir, 2006). On the other hand, Malaysia encourage the unskilled or semi-skilled employees to Malaysia. Kanapathy (2008) in Rahmah Ismail and Ferayuliani Yuliyusman (2014) reported that unskilled and semi-skilled employees comprises the largest portion of migrants in Malaysia. In 2006, there were 1,869,209 unskilled and semi-skilled foreign employees while there were only 55,549 of expatriates, professionals and technical migrants. Singapore and Hong Kong were placed among the top 10 productive economies that attract high-skilled employees, Japan and Korea were positioned as the next 20 most productive economies while Malaysia was ranked as one of the least productive economies (see figure 4.0).

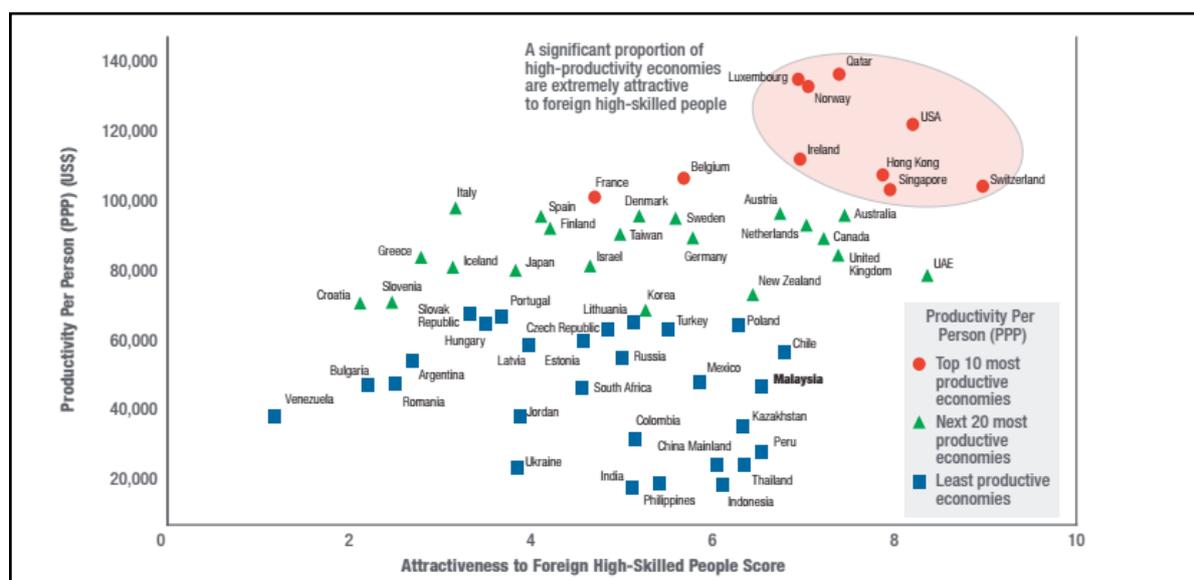


Figure 4.0: Productive countries – Attracting high-skilled people

(Source: MPC, 2015)

Salary and other benefits could be the main pulling factor that encourage skilled or professional employees even from Malaysia to migrate to Singapore. According to MPC (2015), Singapore's average salary for engineering, architecture, accounting and finance and legal were far better than Malaysia. The salary differences for some of these specialization were more than 60%.

C. Intellectual properties for Malaysia, Singapore, Japan, China and Korea

Table 1 and Table 2 represented the intellectual properties (patents, trademarks and designs) registered for the aforementioned countries from year 2010 to 2018.

Table 1: Statistics of Trademarks registrations for Hong Kong, Japan, Malaysia, Korea and Singapore from year 2010 to 2018

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
China(Hong Kong)	8482	8430	9111	11144	12095	14376	13336	14509	14953
Japan	1841	2107	2156	2545	2075	2158	2350	2524	3076
Malaysia	88	84	97	139	127	139	257	128	219
Korea	331	339	448	498	694	1343	1205	1050	1163
Singapore	263	330	300	314	378	440	525	582	581

(Adapted from Intellectual property department, 2019)

Table 2: Statistics of designs registered for Hong Kong, Japan, Malaysia and Singapore from year 2010 to 2018

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018
China(Hong Kong)	1,794	1,638	1,468	1,437	1,421	1360	1078	1127	1282
Japan	404	467	348	421	355	280	321	387	399
Malaysia	1	0	0	5	7	2	2	3	13
Singapore	29	268	60	39	20	8	11	10	7

(Adapted from Intellectual property department, 2019)

Table 3: Patents Granted by the United States Patent and Trademark Office .

Year	Malaysia	Japan	Korea	Singapore	China
Pre-2002	485	962	21,706	1,261	1,091
2002	55	34,858	3,786	410	288
2003	50	35,515	3944	427	297
2004	80	35,346	4428	449	403
2005	88	30,340	4351	346	402
2006	113	36,807	5908	412	659
2007	158	33,354	6295	393	770
2008	152	33,362	7548	399	1223
2009	158	35,501	8762	436	1654
2010	202	44,813	11671	603	2655
2011	161	46,139	12262	647	3174
2012	210	50,677	13233	810	4637
2013	214	51,919	14548	797	5928
2014	259	53,484	16469	946	7236
2015	256	52,409	17924	966	8116
TOTAL (2002-2015)	2156	575208	131129	8041	37442

Source: United States Patent and Trademark Office .

Based on the above statistics, Malaysia is far behind than other countries such as Singapore, China, Japan and Korea. Although Malaysian government provides various fund allocations and grants for research and development, obviously it is insufficient to stimulate the creation of intellectual properties or innovative strategies in Malaysia. We are still considered as the user of innovative products and services rather the developer.

D. University rankings

Malaysian university ranking also declining in recent years. According to QS World University Rankings (2019/20) Singapore's two universities were placed in top 15 ranking. The two universities are National University of Singapore (11th) and Nanyang Technological University (12th). Universiti Malaya, Universiti Sains Malaysia, Universiti Teknologi Malaysia, Universiti Kebangsaan Malaysia and Universiti Putra Malaysia were ranked as 87, 207, 228, 184 and 202 respectively. Four universities in Hong Kong were ranked in top 50 positions. On other hand, Japan's universities ranking also better than Malaysian's public varsities such as Kyoto University (38th), The University of Tokyo (23th), Tokyo Institute of Technology (58th) and Osaka University (67th). Although the number of public and private varsities are increasing in Malaysia, the improvement on the quality is not encouraging.

IV. Conclusion

Malaysia must improve its innovation strategies in order to compete with other Asian countries such as Singapore, Japan, China (Hong Kong) and Korea. Innovation strategies and development are crucial in upgrading Malaysia as developed country. Singapore with a smaller population and without natural resources is moving ahead in innovation. Its performance is better even in latest GII annual survey. Japan, although suffered from natural disasters, stagnant innovation and aging population still performed better than Malaysia.

In my opinion, Malaysia should invest heavily in education sector. Education and training must have a higher priority in development and also budget allocation. Innovation can be developed if workforce is highly skilful and knowledgeable. Public and private varsities should concentrate on more research and development. Government should provide adequate fund for research and development activities.

Government should make Malaysia as an attractive destination for skilled workforce and professionals to work. Better incentives, salary and fair treatment should be given to all to avoid brain drain. There must be a continuous assessment and research on innovation strategies and the result should be made public and corrective actions must be taken to improve those innovation categories. Private sector too should play an active role in developing Malaysia's innovation strategies. They should introduce innovation to varsity students prior to their graduation during their industrial trainings. Private sector could also provide funds and grant allocations for design and development of products and services. One should not ignore the fact that many of the innovations that we had today were created by inventors when they were still pursuing their tertiary education. For an instance, Larry Page and Sergey Brin developed Google as their PhD project, Microsoft were founded when Bill Gates and Paul Allen were students at Harvard University, or Facebook was launched by Mark Zuckerberg when he was still a student at Harvard.

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Recurrent Cystic Hygroma In Adults: a rare case report

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Abstract- Cystic hygroma is an aberrant proliferation of lymphatic vessels resulting from abnormal development of the lymphatic system^{1,2}.

Recurrent cystic hygroma can result from inadequate excision or specific tumour characteristics.³

We report a case of recurrent cystic hygroma in right axilla in a 18 year old male the surgical management of which was challenging due to large size, proximity to vital structure, unusual location.

Index Terms- Recurrent,Cystic hygroma,Adults,

I. INTRODUCTION

Cystic hygroma is a benign lymphatic malformation most commonly occurring in the cervicofacial region and age less than 2 years. It arises from sequestration of lymphatics or obstruction of lymphatic vessels⁴.Cystic hygroma occurs as a result of sequestration or obstruction of developing lymph vessels in approximately 1 in 12,000 births.⁴Although the lesion can occur anywhere, most common site is posterior triangle of neck.The mass may be apparent at birth or may appear and enlarge rapidly in early weeks or months of life as lymph accumulate; mostly present by age of 2 years.⁴

Diagnosis can be made clinically as swelling is soft, partially compressible and brilliantly transillumination on examination compare to other neck masses. Diagnosis is often aided by the use of fine needle aspiration for cytology, tissue histology, and ultrasound, MRI, or CT for definition of the mass. Loculations or cysts can often be appreciated and affected structures can be identified⁵.The modern management of lymphatic malformation includes combination of complete surgical excision and image guided sclerotherapy.⁴

II. CASE PRESENTATION

A 19 year old male, presented in surgery outdoor with complain of swelling over right upper chest since 5 days. Swelling was sudden in onset with no history of any preceding respiratory complaint or trauma. Patient had history of surgery for large mass at his age of 1.5yr, as told by patient(no document available).Patient is admitted for further management.

On examination swelling is visible over right upper chest, normal skin over swelling, linear horizontal scar visible just below right breast extending toward right axilla. On palpation swelling is soft cystic, non-tender, no local rise of temperature, swelling does not move in any direction, swelling is transilluminant and fluctuation present.

After admission of patient routine investigations performed. Chest x-ray is performed which suggest a soft tissue shadow near right shoulder joint which does not show any connection with pleural cavity. Patient sent for ultrasonography which suggest volume collection of around 100 ml, surrounded by irregular wall in intramuscular plane. This collection is inferiorly displacing subclavian vessels. On CT scan of chest, collection of size 6*8*7 cm seen in anterolateral chest wall and extending into right axillary region. The collection located in between pectoralis major and pectoralis minor muscles, collection showing focal loss of fat plane with right subclavian artery



Fig 1: CECT Thorax showing

The patient underwent surgical exploration of lesion, incision made over swelling along with skin crease extending towards axilla. The mass was encapsulated within a thin wall and adherent to pectoralis major and pectoralis minor muscles. Adhesions were divided by blunt dissection by artery forceps. Complete removal of wall of cyst was achieved. All the important nerves and arteries encountered during dissection are preserved. Macroscopically lesion measured 8*7 cm in horizontal and vertical dimensions. Histopathological examination revealed cystic space lined with endothelium like cells consistent with diagnosis of cystic hygroma.



Fig 2: Intra operative picture of Cystic

Hygroma anterior chest wall

Post-operatively patient recovered well without any movement restriction of shoulder joint. Patient discharged on postoperative day three after removal of suction drain and histopathological examination report received.

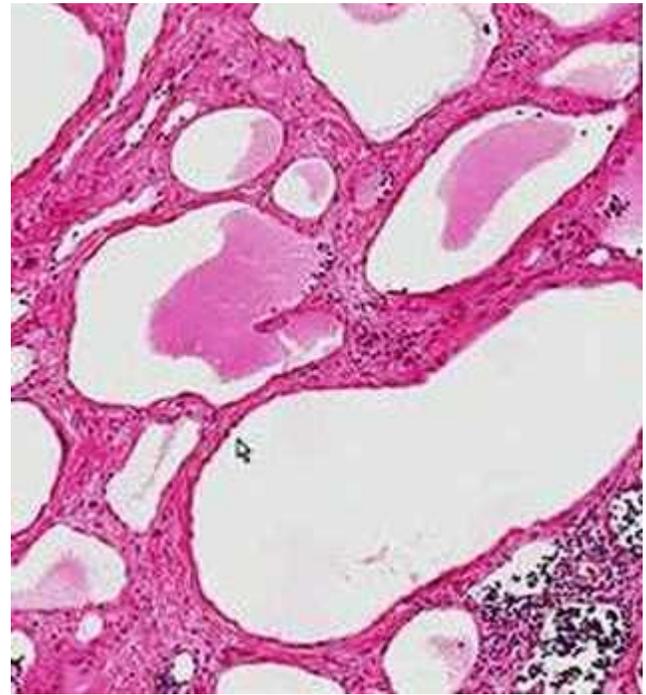


Fig 3: Represents Histopathological image of cystic hygroma

III. DISCUSSION

Most cystic hygromas present in-utero or in infancy and therefore most of the literature on management focuses on paediatric cases. Cystic hygroma considered to arise from congenital malformation of the lymphatic system in which a failure of communication between the lymphatic and venous pathways leads to lymph accumulation. The effect of these lesions depends on their position and their relationship to surrounding structures. Most common adult presentation is of a painless lump in an otherwise asymptomatic patient.⁶

Differential diagnosis for a cystic hygroma includes soft tissue sarcoma, abscess synovial cyst and haematoma.⁷ Although it was strongly suspected in initial examination as in this case patient had history of surgery in his childhood and swelling was transilluminant.

Pre-operative investigations were done to find out the location of the lesion and its relation to surrounding vital structures and also because of the extreme rarity of this condition in adults.

Treatment of cystic hygroma historically required surgical excision⁸. In this case it was considered that the ideal treatment would be complete surgical excision. Successful surgical excision has been found to correlate histology, encapsulation completeness.

Complications of surgery like scar, injury to blood vessels and nerves wound infection and recurrence were informed to patients before consent was obtained for surgery.

Although sclerotherapy is now well established in treatment of neonatal and paediatric cystic hygroma, there have been very few cases reported of its use in adults. Some success has been observed in small number of adults with sclerotherapy agents such as OK-432.⁹

IV. CONCLUSION

Cystic hygroma is a rare entity in adults. Management of cystic hygroma particularly for more advanced stage lesions, remains a complicated issue and decision should be made on individual case basis.

We report this case of recurrent cystic hygroma in an adult and it could be only source to inform the surgeons about the management outcomes and should be encouraged.

This case contributes to the evidence supporting the role of cystic hygroma in differential diagnosis for cystic masses in adults. Further the future management of cystic hygroma in axilla with proximity to vital structures is better informed with our addition to examples of uncomplicated resection.

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Bayes' Estimators of an Exponentially Distributed Random Variables Using Al-Bayyati's Loss Function

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Abstract — This research work discusses on the estimation of an unknown rate parameter of an Exponential distribution using Bayesian methodology under the Al-Bayyati's loss function with different prior distributions. The rate parameter of an Exponential distribution is assumed to follow non-informative prior distribution (such as extension of Jeffrey's prior distribution) and informative prior distribution (such as Gamma prior distribution, Gamma-Chi-square prior distribution, Gamma – Exponential prior distribution and Chi-square-Exponential prior distribution). The posterior distributions for the unknown rate of an Exponential distribution were derived using Bayes' theorem and the estimates under Al-Bayyati's loss function was obtained for the different prior distributions. A simulation study was considered to investigate the performance of the estimators under different prior distribution and various sample sizes. The estimators are then compared in terms of mean square error (MSE) which is computed using R programming Language. It was observed that the estimates of the unknown parameter under different priors are very close to the true parameter and that the mean square errors (MSE) of the estimates of the rate parameter increases as the increase of the rate parameter vale with all sample size. It was observed that the Bayesian rate estimates under informative prior distributions proves to be better than the estimates under the non-informative prior distributions proves to be efficient with minimum mean square error.

Keywords: MSE, Al-Bayyati's loss function, non-informative prior distribution, Informative prior distribution, Posterior distribution

1. INTRODUCTION

In Bayesian analysis, the unknown parameter is regarded as being the value of a random variable from a given probability distribution, with the knowledge of some information about the value of parameter prior to observing the data x_1, x_2, \dots, x_n . The exponential distribution was the first widely used lifetime distribution model in areas such as the lifetimes of manufactured items [5], [7], [8], survival or remission times in chronic diseases [10] and in agricultural experiment [8]. The widely use of an Exponential distribution was its ability to model life time dataset due to its availability of simple statistical methods for it [7] and also because of its suitability for representing the lifetimes of many things such as various types of manufactured items [5]. In real-world scenarios, the assumption of a constant rate (or probability per unit time) is rarely satisfied. For example, the rate of incoming phone calls differs according to the time of day. In queuing theory, the service times of agents in a system (e.g. how long it takes for a bank teller etc. to serve a customer) are often modeled as exponentially distributed variables. Maximum likelihood estimation has been the widely used method to estimate the parameter of a probability distributions.

However, Bayes method has begun to get the attention of researchers in the estimation processes. The only aspect of statistics that can combine both modelling inherit uncertainty and statistical theory is Bayesian statistics. This method provides a way to learn from the dataset.

[6] presented some thought-provoking insights on the relationship between Bayesian and classical estimation using the exponential distribution. He proved how the classical estimators can be obtained from various choices made within Bayesian framework. [12], and [14] focused on the estimation of Exponential and Gamma distribution using Bayesian methods and adopted the use of Normal and Laplace approximations to estimate the parameters.

Exponential distribution is a special case of Gamma distribution

$$G(a, \gamma) = \frac{\gamma^a}{\Gamma(a)} e^{-\gamma x} x^{a-1} \quad a > 0, \gamma > 0 \quad (1)$$

When $a = 1$, it becomes an exponential distribution with probability mass function of the form

$$f(x, \gamma) = \gamma e^{-\gamma x}; \quad x = 0, 1, 2, 3, \dots, \gamma > 0 \quad (2)$$

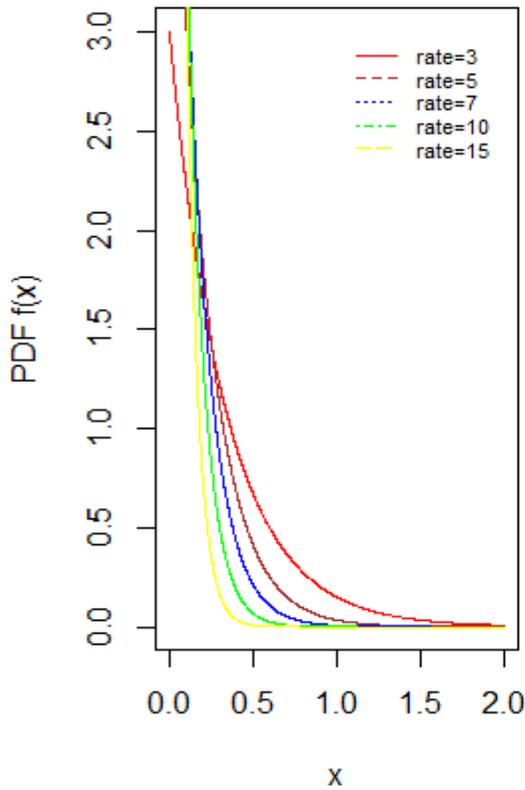


Figure 1: PDF curve of an Exponential Distribution at Different Values of Rate Parameter

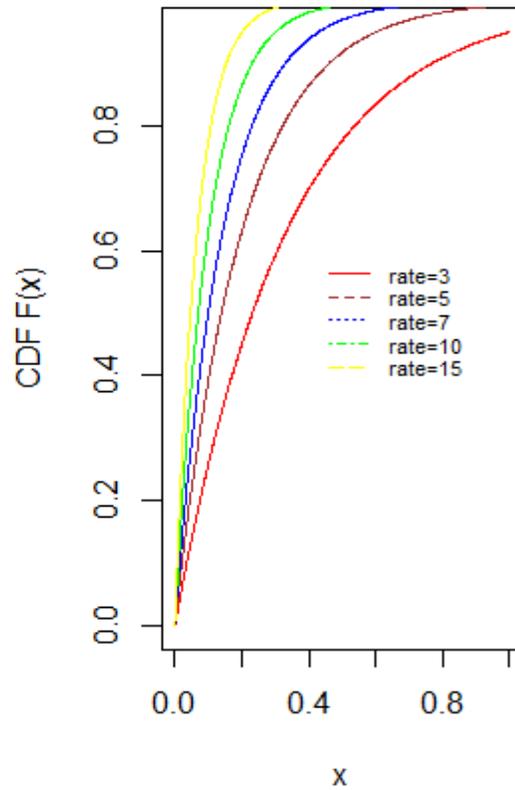


Figure 2: CDF curve of an Exponential Distribution at Different Values of Rate Parameter

2.0 MATERIALS AND METHODS

2.1 Prior Information

In Bayesian statistics, a prior probability information which is also known as prior distribution of an uncertain quantity is the probability distribution that would express one’s beliefs about this quantity before evidence is considered. The most important part of a Bayesian estimation is the specification of a prior distribution.

Although, at times priors are chosen according to one’s subjective knowledge and belief that is why Bayesian approach is sometimes called a subjective approach [4]. In this research work two types of prior information will be adopted namely; non-informative prior distribution (such as extension of Jeffrey’s prior distribution) and informative prior distribution (such as Gamma prior distribution, Gamma-Chi-square prior distribution, Gamma – Exponential prior distribution and Chi-square-Exponential prior distribution).

2.1.1 Extension of the Jefferey’s Prior:

The prior proposed by [3], [11] and [13], known as extension of Jeffrey’s prior is given by $g(\gamma) \propto [I(\gamma)]^k; k \in \mathcal{R}^+$ (3)

Where $I(\gamma) = -nE \left[\frac{\partial^2}{\partial \gamma^2} \log f(x; \gamma) \right]$ is known as Fisher’s information matrix. Therefore $I(\gamma)$ for Exponential distribution will be

$$I(\gamma) = -n \left[\frac{\partial^2}{\partial \gamma^2} \{ \ln \gamma - \gamma x \} \right] \tag{4}$$

Thus, the resulting extension of Jeffrey’s prior will be

$$g_1(\gamma) \propto \left(\frac{1}{\gamma^2} \right)^k \tag{5}$$

Remark 1: if $k = \frac{1}{2}$, we will have Jeffrey’s prior

$$g_{11}(\gamma) \propto \frac{1}{\gamma} \tag{6}$$

Remark 2: if $k = \frac{3}{2}$, we will have Hartigan’s prior

$$g_{12}(\gamma) \propto \frac{1}{\gamma^3} \tag{7}$$

Remark 3: if $k = 0$, we will have $U(0, k=\frac{1}{p})$ prior

$$g_{13}(\gamma) \propto 1 \tag{8}$$

2.1.2 The Gamma Prior

The single prior distribution of γ is a Gamma distribution with hyper parameters α_1 and β_1 is

$$g_2(\gamma) = \frac{\beta_1^{\alpha_1}}{\Gamma(\alpha_1)} \gamma^{\alpha_1-1} e^{-\beta_1 \gamma}; \alpha_1 > 0, \beta_1 > 0 \tag{9}$$

2.1.3 Gamma-Chi-Square Prior

Assume that the prior distribution of γ is a Gamma distribution with hyper parameters α_2 and β_2 as

$$g_{31}(\gamma) = \frac{\beta_2^{\alpha_2}}{\Gamma(\alpha_2)} \gamma^{\alpha_2-1} e^{-\beta_2 \gamma}; \alpha_2 > 0, \beta_2 > 0 \quad (10)$$

The second prior assumed is a Chi-square distribution with hyper parameter ψ_1 given by

$$g_{32}(\gamma) = \frac{1}{2^{\frac{\psi_1}{2}} \Gamma(\frac{\psi_1}{2})} \gamma^{\frac{\psi_1}{2}-1} e^{-\frac{\gamma}{2}}; \psi_1 > 0, \gamma > 0 \quad (11)$$

[1] defined the double prior for γ by combining the two priors in (10) and (11) as:

$$g_3(\gamma) \propto g_{31}(\gamma)g_{32}(\gamma) \\ g_3(\gamma) \propto \gamma^{\alpha_2+\frac{\psi_1}{2}-2} e^{-\gamma(\frac{1}{2}+\beta_2)} \quad (12)$$

2.1.4 Gamma - Exponential distribution

The double prior for γ is defined to be a Gamma distribution with hyper parameters (α_3, β_3) and an exponential distribution with hyper parameter δ_1 as

$$g_{41}(\gamma) = \frac{\beta_3^{\alpha_3}}{\Gamma(\alpha_3)} \gamma^{\alpha_3-1} e^{-\beta_3 \gamma}; \alpha_3 > 0, \beta_3 > 0 \quad (13)$$

$$g_{42}(\gamma) = \delta_1 e^{-\delta_1 \gamma}; \delta_1 > 0 \quad (14)$$

[1] defined the double prior for γ by combining the two priors in (13) and (14) as:

$$g_4 \propto p_3(\gamma)p_4(\gamma) \\ g_4 \propto \gamma^{\alpha_3-1} e^{-\gamma(\delta_1+\beta_3)} \quad (15)$$

2.1.5 Chi-Square-Exponential Prior

The double prior for γ is defined to be a Gamma distribution with hyper parameters ψ_2 and an exponential distribution with hyper parameter δ_2 as

$$g_{51}(\gamma) = \frac{1}{2^{\frac{\psi_2}{2}} \Gamma(\frac{\psi_2}{2})} \gamma^{\frac{\psi_2}{2}-1} e^{-\frac{\gamma}{2}}; \psi_2 > 0, \gamma > 0 \quad (16)$$

$$g_{52}(\gamma) = \delta_2 e^{-\delta_2 \gamma}; \delta_2 > 0 \quad (17)$$

[1] defined a double prior for γ by combining the two priors in (16) and (17) as:

$$g_5 \propto \gamma^{\frac{\psi_2}{2}-1} e^{-\gamma(\frac{1}{2}+\delta_2)} \quad (18)$$

2.1 Loss Function

The concept of loss function is as old as Laplace and was reintroduced in statistics by Abraham Wald in the middle of 20th Century. Sound statistical practice requires selecting an estimator consistent with the actual acceptable variation experienced in the context of a particular applied problem. In this paper we considered the use of Al-Bayyati's loss function for better comparison of Bayes' estimators.

2.1.1 Al-Bayyati's Loss Function

The Al-Bayyati's loss function was stated by [7] as

$$R_{AL}(\hat{\gamma}, \gamma) = \gamma^{c_2} (\hat{\gamma} - \gamma)^2; c_2 \in \mathcal{R}^+ \quad (19)$$

Where $\hat{\gamma}$ is the estimated value of parameter γ .

3. ESTIMATION

3.1 Maximum Likelihood Estimation

Let x_1, x_2, \dots, x_n be a random sample size n from Exponential distribution. The maximum likelihood estimator γ of the

parameter γ which maximizes the likelihood function will be as follows [15] and [16]

$$L(x; \gamma) = \prod_{i=1}^n f(x; \gamma) \\ L(x; \gamma) = \gamma^n e^{-\gamma \sum x}$$

The log-likelihood function for an Exponential distribution can be expressed as

$$\log L(\gamma|x) = n \log \gamma - \gamma \sum x \quad (20)$$

Now solving $\frac{\partial}{\partial \gamma} \log\{L(\gamma|x)\} = 0$

$$\hat{\gamma} = \left(\frac{\sum x}{n}\right)^{-1} \quad (21)$$

3.2 Bayesian Estimation

To obtain Bayes estimators, we assume that γ is a real valued random variable with probability density function $g(\gamma)$. The posterior distribution of γ i. e. $h(\gamma|x)$ is the conditional probability density function of γ given the data. In this section we consider Bayes estimation of the unknown parameter γ based on the above-mentioned priors and loss function.

3.2.1 Posterior Distribution of Unknown Parameter γ Using extension of the Jeffrey's Prior

The posterior distribution for γ using extension of the Jeffrey's prior

$$h_1(\gamma|x) = \frac{L(x|\gamma)g_1(\gamma)}{\int_0^\infty L(x|\gamma)g_1(\gamma) \partial \gamma} \\ h_1(\gamma|x) \propto \frac{\gamma^n e^{-\gamma \sum x} \left(\frac{1}{\gamma^2}\right)^k}{\int_0^\infty \gamma^n e^{-\gamma \sum x} \left(\frac{1}{\gamma^2}\right)^k \partial \gamma} \\ p(\gamma|\gamma) \propto \gamma^{n-2k} e^{-\gamma \sum x}$$

which is the density function of a Gamma distribution of

$$h_1(\gamma|x) \propto \frac{(\sum x)^{n-2k+1}}{\Gamma(n-2k+1)} \gamma^{n-1} e^{-\gamma \sum x} \quad (22)$$

with parameters $(n-2k+1, \sum x)$.

$$Mean = E(X) = \frac{n-2k+1}{\sum x}$$

$$Var(X) = \frac{n-2k+1}{\sum x^2}$$

3.2.2 Posterior Distribution of Unknown Parameter γ Using Gamma Prior

The posterior distribution for γ using Gamma prior

$$h_2(\gamma|x) = \frac{L(x|\gamma)g_2(\gamma)}{\int_0^\infty L(x|\gamma)g_2(\gamma) \partial \gamma} \\ h_2(\gamma|x) \propto \frac{\gamma^n e^{-\gamma \sum x} \gamma^{\alpha_1-1} e^{-\beta_1 \gamma}}{\int_0^\infty \gamma^n e^{-\gamma \sum x} \gamma^{\alpha_1-1} e^{-\beta_1 \gamma} \partial \gamma}$$

$$h_2(\gamma|x) \propto \gamma^{n+\alpha_1-1} e^{-\gamma(\beta_1+\sum x)}$$

which is the density function of a Gamma distribution of

$$h_2(\gamma|x) = \frac{(\beta_1+\sum x)^{n+\alpha_1}}{\Gamma(n+\alpha_1)} \gamma^{n+\alpha_1-1} e^{-\gamma(\sum x+\beta_1)} \quad (23)$$

With parameters $(n+\alpha_1, \sum x+\beta_1)$

$$\text{Mean} = E(x) = \frac{n + \alpha_1}{\beta_1 + \sum x}$$

$$\text{Var}(x) = \frac{n + \alpha_1}{(\beta_1 + \sum x)^2}$$

3.2.3 Posterior Distribution of Unknown Parameter γ Using Gamma-Chi-Square Prior

The posterior distribution for γ using Gamma-Chi-Square Prior

$$h_3(\gamma|x) = \frac{L(x|\gamma)g_3(\gamma)}{\int_0^\infty L(x|\gamma)g_3(\gamma)\partial\gamma}$$

$$h_3(\gamma|x) \propto \frac{\gamma^n e^{-\gamma\sum x} \gamma^{\alpha_2 + \frac{\psi_1}{2} - 2} e^{-\gamma(\frac{1}{2} + \beta_2)}}{\int_0^\infty \gamma^n e^{-\gamma\sum x} \gamma^{\alpha_2 + \frac{\psi_1}{2} - 2} e^{-\gamma(\frac{1}{2} + \beta_2)} \partial\gamma}$$

$$h_3(\gamma|x) \propto \gamma^{(\alpha_2 + \frac{\psi_1}{2} + n - 1) - 1} e^{-\gamma(\beta_1 + \sum x + \frac{1}{2})}$$

which is the density function of a Gamma distribution of $h_3(\gamma|x)$

$$= \frac{(\beta_1 + \sum x + \frac{1}{2})^{\alpha_2 + \frac{\psi_1}{2} + n - 1}}{\Gamma(\alpha_2 + \frac{\psi_1}{2} + n - 1)} \gamma^{(\alpha_2 + \frac{\psi_1}{2} + n - 1) - 1} e^{-\gamma(\beta_1 + \sum x + \frac{1}{2})}$$

(24)

With parameters $(\alpha_2 + \frac{\psi_1}{2} + n - 1, \beta_1 + \sum x + \frac{1}{2})$

$$\text{Mean} = E(x) = \frac{n + \alpha_2 + \frac{\psi_1}{2} - 1}{\beta_2 + \sum x + \frac{1}{2}}$$

$$\text{Var}(x) = \frac{n + \alpha_2 + \frac{\psi_1}{2} - 1}{(\beta_2 + \sum x + \frac{1}{2})^2}$$

3.2.4 Posterior Distribution of Unknown Parameter γ Using Gamma-Exponential Prior

The posterior distribution for γ using Gamma-Exponential Prior

$$h_4(\gamma|x) = \frac{L(x|\gamma)g_4(\gamma)}{\int_0^\infty L(x|\gamma)g_4(\gamma)\partial\gamma}$$

$$h_4(\gamma|x) \propto \frac{\gamma^n e^{-\gamma\sum x} \gamma^{\alpha_3 - 1} e^{-\gamma(\delta_1 + \beta_3)}}{\int_0^\infty \gamma^n e^{-\gamma\sum x} \gamma^{\alpha_3 - 1} e^{-\gamma(\delta_1 + \beta_3)} \partial\gamma}$$

$$p(\gamma|x) \propto \gamma^{n + \alpha_3 - 1} e^{-\gamma(\delta_1 + \beta_3 + \sum x)}$$

which is the density function of a Gamma distribution of

$$p(\gamma|x) = \frac{(\delta_1 + \beta_3 + \sum x)^{n + \alpha_3}}{\Gamma(n + \alpha_3)} \gamma^{n + \alpha_3 - 1} e^{-\gamma(\delta_1 + \beta_3 + \sum x)}$$

(25)

With parameters $(n + \alpha_3, \delta_1 + \beta_3 + \sum x)$

$$\text{Mean} = E(X) = \frac{n + \alpha_3}{\delta_1 + \beta_3 + \sum x}$$

$$\text{Var}(X) = \frac{n + \alpha_3}{(\delta_1 + \beta_3 + \sum x)^2}$$

3.2.5 Posterior Distribution of Unknown Parameter γ Using Chi-Square-Exponential Prior

$$h_5(\gamma|x) = \frac{L(x|\gamma)g_5(\gamma)}{\int_0^\infty L(x|\gamma)g_5(\gamma)\partial\gamma}$$

$$h_5(\gamma|x) \propto \frac{\gamma^n e^{-\gamma\sum x} \gamma^{\frac{\psi_2}{2} - 1} e^{-\gamma(\frac{1}{2} + \delta_2)}}{\int_0^\infty \gamma^n e^{-\gamma\sum x} \gamma^{\frac{\psi_2}{2} - 1} e^{-\gamma(\frac{1}{2} + \delta_2)} \partial\gamma}$$

$$h_5(\gamma|x) \propto \gamma^{(n + \frac{\psi_2}{2} - 1)} e^{-\gamma(\delta_2 + \sum x + \frac{1}{2})}$$

which is the density function of a Gamma distribution of

$$h_5(\gamma|x) = \frac{(\delta_2 + \sum x + \frac{1}{2})^{n + \frac{\psi_2}{2}}}{\Gamma(n + \frac{\psi_2}{2})} \gamma^{(\frac{\psi_2}{2} + n - 1)} e^{-\gamma(\delta_2 + \sum x + \frac{1}{2})}$$

(26)

With parameters $(n + \frac{\psi_2}{2}, \delta_2 + \sum x + \frac{1}{2})$

$$\text{Mean} = E(x) = \frac{n + \frac{\psi_2}{2}}{\delta_2 + \sum x + \frac{1}{2}}$$

$$\text{Var}(x) = \frac{n + \frac{\psi_2}{2}}{(\delta_2 + \sum x + \frac{1}{2})^2}$$

3.3 Bayes' Estimator Under Al-Bayyati's Loss Function

The risk function under Al-Bayyati's loss function can be define is

$$R_{(AL,EJ)}(\hat{\gamma}) = \int_0^\infty \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_i(\gamma|x) \partial\gamma$$

(27)

3.3.1 Extension of Jeffrey's Prior

The risk function under Al-Bayyati's loss function using extension of Jeffrey's prior is given by

$$R_{(AL,EJ)}(\hat{\gamma}) = \int_0^\infty \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_1(\gamma|x) \partial\gamma$$

$$R_{(AL,EJ)}(\hat{\gamma}) = \int_0^\infty \gamma^{c_2} (\hat{\gamma} - \gamma)^2 \frac{(\sum x)^{n-2k+1}}{\Gamma(n-2k+1)} \gamma^{n-1} e^{-\gamma\sum x} \partial\gamma$$

(28)

$$R_{(AL,EJ)}(\hat{\gamma}) = \frac{\hat{\gamma}^2 \Gamma(n - 2k + c_2 + 1)}{\Gamma(n - 2k + 1) (\sum x)^{c_2 + 1}} - \frac{2\hat{\gamma} \Gamma(n - 2k + c_2 + 2)}{\Gamma(n - 2k + 1) (\sum x)^{c_2 + 1}} + \frac{\Gamma(n - 2k + c_2 + 3)}{\Gamma(n - 2k + 1) (\sum x)^{c_2 + 2}}$$

Now, solving $\frac{R_{(AL,EJ)}(\hat{\gamma})}{\partial\hat{\gamma}} = 0$ for $\hat{\gamma}$ yield the required Bayes' estimator under the assumed combination of loss function and prior distribution in given by

$$\hat{\gamma}_{(AL,EJ)} = \frac{n - 2k + c_2 + 1}{\sum x}$$

(29)

3.3.2 Gamma Prior Distribution

The risk function under Al-Bayyati's loss function using extension of Gamma prior is given by

$$R_{(AL,GP)}(\hat{\gamma}) = \int_0^\infty \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_2(\gamma|x) \partial\gamma$$

$$R_{(AL,GP)}(\hat{\gamma}) = \int_0^\infty \gamma^{c_2} (\hat{\gamma} - \gamma)^2 \frac{(\beta_1 + \sum x)^{n + \alpha_1}}{\Gamma(n + \alpha_1)} \gamma^{n + \alpha_1 - 1} e^{-\gamma(\sum x + \beta_1)} \partial\gamma$$

$$R_{(AL,GP)}(\hat{\gamma}) = \frac{\hat{\gamma}^2 \Gamma(n + \alpha_1 + c_2)}{\Gamma(n + \alpha_1)(\sum x + \beta_1)^{c_2}} \tag{30}$$

$$- \frac{2\hat{\gamma} \Gamma(n + \alpha_1 + c_2 + 1)}{\Gamma(n + \alpha_1)(\sum x + \beta_1)^{c_2+1}}$$

$$+ \frac{\Gamma(n + \alpha_1 + c_2 + 2)}{\Gamma(n + \alpha_1)(\sum x + \beta_1)^{c_2+2}}$$

Now, solving $\frac{R_{(AL,GP)}(\hat{\gamma})}{\partial \hat{\gamma}} = 0$ for $\hat{\gamma}$ yield the required bayes estimator under the assumed combination of loss function and prior distribution in given by

$$\hat{\gamma}_{(AL,GP)} = \frac{n + \alpha_1 + c_2}{\sum x + \beta_1} \tag{31}$$

3.3.3 Gamma- Chi-Square Prior Distribution

The risk function under Al-Bayyati's loss function using extension of Gamma- Chi-square prior is given by

$$R_{(AL,GC)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_3(\gamma|x) \partial \gamma$$

$$R_{(AL,GC)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 \frac{(\beta_1 + \sum x + \frac{1}{2})^{\alpha_2 + \frac{\psi_1}{2} + n - 1}}{\Gamma(\alpha_2 + \frac{\psi_1}{2} + n - 1)} \gamma^{(\alpha_2 + \frac{\psi_1}{2} + n - 1) - 1} e^{-\gamma(\beta_1 + \sum x + \frac{1}{2})} \partial \gamma \tag{32}$$

$$R_{(AL,GC)}(\hat{\gamma}) = \frac{\hat{\gamma}^2 \Gamma(n + \alpha_2 + \frac{\psi_1}{2} + c_2 - 1)}{\Gamma(n + \alpha_2 + \frac{\psi_1}{2} - 1) (\sum x + \frac{1}{2} + \beta_1)^{c_2}}$$

$$- \frac{2\hat{\gamma} \Gamma(n + \alpha_2 + \frac{\psi_1}{2} + c_2)}{\Gamma(n + \alpha_2 + \frac{\psi_1}{2} - 1) (\sum x + \frac{1}{2} + \beta_1)^{c_2+1}}$$

$$+ \frac{\Gamma(n + \alpha_2 + \frac{\psi_1}{2} + c_2)}{\Gamma(n + \alpha_2 + \frac{\psi_1}{2} - 1) (\sum x + \frac{1}{2} + \beta_1)^{c_2+2}}$$

Now, solving $\frac{R_{(AL,GC)}(\hat{\gamma})}{\partial \hat{\gamma}} = 0$ for $\hat{\gamma}$ yield the required bayes estimator under the assumed combination of loss function and prior distribution in given by

$$\hat{\gamma}_{(AL,GC)} = \frac{n + \alpha_2 + \frac{\psi_1}{2} + c_2 - 1}{\sum x + \frac{1}{2} + \beta_1} \tag{33}$$

3.3.4 Gamma- Exponential Prior Distribution

The risk function under Al-Bayyati's loss function using extension of Gamma- Exponential prior is given by

$$R_{(AL,GE)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_3(\gamma|x) \partial \gamma$$

$$R_{(AL,GE)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 \frac{(\delta_1 + \beta_3 + \sum x)^{n + \alpha_3}}{\Gamma(n + \alpha_3)} \gamma^{n + \alpha_3 - 1} e^{-\gamma(\delta_1 + \beta_3 + \sum x)} \partial \gamma \tag{34}$$

$$R_{(AL,GC)}(\hat{\gamma}) = \frac{\hat{\gamma}^2 \Gamma(n + \alpha_3 + c_2 + 2)}{\Gamma(n + \alpha_3 + 2) (\sum x + \beta_3 + \delta_1)^{c_2}}$$

$$- \frac{2\hat{\gamma} \Gamma(n + \alpha_3 + c_2 + 3)}{\Gamma(n + \alpha_3 + 2) (\sum x + \beta_3 + \delta_1)^{c_2+1}}$$

$$+ \frac{\Gamma(n + \alpha_3 + c_2 + 4)}{\Gamma(n + \alpha_3 + 2) (\sum x + \beta_3 + \delta_1)^{c_2+2}}$$

Now, solving $\frac{R_{(AL,GE)}(\hat{\gamma})}{\partial \hat{\gamma}} = 0$ for $\hat{\gamma}$ yield the required bayes estimator under the assumed combination of loss function and prior distribution in given by

$$\hat{\gamma}_{(AL,GE)} = \frac{n + \alpha_3 + c_2 + 2}{\sum x + \beta_3 + \delta_1} \tag{35}$$

3.3.5 Chi-Square-Exponential Prior Distribution

The risk function under Al-Bayyati's loss function using extension of Chi-square-Exponential prior is given by

$$R_{(AL,CE)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 h_3(\gamma|x) \partial \gamma$$

$$R_{(AL,CE)}(\hat{\gamma}) = \int_0^{\infty} \gamma^{c_2} (\hat{\gamma} - \gamma)^2 \frac{(\delta_2 + \sum x + \frac{1}{2})^{n + \frac{\psi_2}{2}}}{\Gamma(n + \frac{\psi_2}{2})} \gamma^{(\frac{\psi_2}{2} + n - 1) - 1} e^{-\gamma(\delta_2 + \sum x + \frac{1}{2})} \partial \gamma \tag{36}$$

$$R_{(AL,CE)}(\hat{\gamma}) = \frac{\hat{\gamma}^2 \Gamma(\frac{\psi_2}{2} + n + c_2)}{\Gamma(\frac{\psi_2}{2} + n) (\delta_2 + \sum x + \frac{1}{2})^{c_2}}$$

$$- \frac{2\hat{\gamma} \Gamma(n + \frac{\psi_2}{2} + n + c_2 + 1)}{\Gamma(\frac{\psi_2}{2} + n) (\delta_2 + \sum x + \frac{1}{2})^{c_2+1}}$$

$$+ \frac{\Gamma(\frac{\psi_2}{2} + n + c_2 + 2)}{\Gamma(\frac{\psi_2}{2} + n) (\delta_2 + \sum x + \frac{1}{2})^{c_2+2}}$$

Now, solving $\frac{R_{(AL,CE)}(\hat{\gamma})}{\partial \hat{\gamma}} = 0$ for $\hat{\gamma}$ yield the required bayes estimator under the assumed combination of loss function and prior distribution in given by

$$\hat{\gamma}_{(AL,CE)} = \frac{\frac{\psi_2}{2} + n + c_2}{\delta_2 + \sum x + \frac{1}{2}} \tag{37}$$

Now, on summarizing the above Bayes' estimators and their special cases, we can have the following table of estimators

Table 1: Bayes' Estimators under Al-Bayyati's loss function and Different Prior Distributions

Prior	Estimator
Extension of Jeffrey's	$\hat{\gamma}_{(AL,EJ)} = \frac{n - 2k + c_2 + 1}{\sum x}$
Hartigan's	$\hat{\gamma}_{(AL,EJ)} = \frac{n - 2 + c_2}{\sum x}$
Jeffrey's	$\hat{\gamma}_{(AL,EJ)} = \frac{n + c_2}{\sum x}$

Uniform	$\hat{\gamma}_{(AL,EJ)} = \frac{n + c_2 + 1}{\sum x}$
Gamma	$\hat{\gamma}_{(AL,GP)} = \frac{n + \alpha_1 + c_2}{\sum x + \beta_1}$
Gamma-Chi-squares	$\hat{\gamma}_{(AL,GC)} = \frac{n + \alpha_2 + \frac{\psi_1}{2} + c_2 - 1}{\sum x + \frac{1}{2} + \beta_1}$
Gamma-Exponential	$\hat{\gamma}_{(AL,GE)} = \frac{n + \alpha_3 + c_2 + 2}{\sum x + \beta_3 + \delta_1}$
Chi-Squares-Exponential	$\hat{\gamma}_{(AL,CE)} = \frac{\frac{\psi_2}{2} + n + c_2}{\delta_2 + \sum x + \frac{1}{2}}$

Note: Subscript in the form ordered pair in each estimator represents the combination of Al-Bayyati’s loss function and prior distribution used in the derivation of Bayes’ estimator. First element of the ordered pair represents Al-Bayyati’s loss function whereas the second element represent prior distribution.

4.0 SIMULATION STUDY OF AN EXPONENTIAL DISTRIBUTION

In the simulation study, data sets of size $n = 50, 100, 200$ and 500 have been generated from Exponential distribution with parameter k taking the values $0, 0.5, 1$ and 1.5 . Whereas, values of another hyper-parameter c_2 are considered to be 1 and 3 . We also set $\alpha_1 = 1.5, 3, \alpha_2 = 1, 2, \alpha_3 = 1, 2, \beta_1 = 1, 5, \beta_2 = 1.5, 3, \beta_3 = 1.5, 3, \psi_1 = 0.5, 1, \psi_2 = 1.5, 3, \delta_1 = 0.5, 1$ and $\delta_2 = 1, 2$. We carried out simulation using R programming language.

The results presented in Tables 2 and 3 displayed the expected an MSE’s for estimating the rate parameter γ under the Extension Jeffrey prior distribution. The results in Tables 4 and 5 displayed the expected and MSE’s for estimating the

rate parameter γ under the Gamma prior distribution. Tables 6 and 7 displayed the expected and MSE’s for estimating the rate parameter γ under the Gamma-Chi-squares prior distribution. Tables 8 and 9 displayed the expected and MSE’s for estimating the rate parameter γ under the Gamma-Exponential prior distribution. Tables 10 and 11 displayed the expected and MSE’s for estimating the rate parameter γ under the Chi-squares-Exponential prior distribution. It was observed that on considering the Hartigan’s prior ($k = 1.5$), usually parameter gets under estimated and starts overestimating it as c_2 increases from 1 to 10 . The behaviour of Bayesian estimates for all informative prior distributions have better behaviour than other estimates when compared with estimates of non-informative prior distribution for different sample sizes and various rate parameters. Finally, for all parameter values, as the sample size increases the MSE keeps reducing.

Table 2: Bayes’ Estimates of Estimators along with their Mean Square Errors under Extension of Jeffrey prior distribution when $\gamma=3$

n	k	c ₂ = 1		c ₂ = 3		c ₂ = 5		c ₂ = 10	
		$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	0.0	3.086	0.099	3.141	0.099	3.216	0.103	3.365	0.119
	0.5	3.365	0.119	3.058	0.095	3.174	0.101	3.331	0.109
	1.0	3.005	0.084	3.099	0.099	3.138	0.103	3.300	0.108
	1.5	2.989	0.095	3.066	0.095	3.123	0.095	3.264	0.106
200	0.0	3.056	0.048	3.090	0.045	3.101	0.045	3.182	0.054
	0.5	3.023	0.047	3.065	0.046	3.094	0.048	3.169	0.046
	1.0	3.020	0.046	3.036	0.055	3.073	0.048	3.510	0.049
	1.5	2.999	0.046	3.042	0.048	3.062	0.049	3.148	0.049
500	0.0	3.014	0.018	3.031	0.019	3.035	0.02	3.067	0.018
	0.5	3.013	0.020	3.030	0.020	3.035	0.017	3.070	0.020
	1.0	3.002	0.019	3.018	0.017	3.031	0.018	3.056	0.018
	1.5	3.003	0.018	3.016	0.018	3.027	0.018	3.054	0.019

Table 3: Bayes' Estimates of Estimators along with their Mean Square Errors under Extension of Jeffrey prior distribution when $\gamma=5$

n	k	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
		$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	0.0	5.118	0.265	5.250	0.262	5.023	0.023	5.630	0.353
	0.5	5.098	0.263	5.214	0.260	5.021	0.023	5.540	0.302
	1.0	5.042	0.245	5.151	0.285	5.024	0.023	5.537	0.308
	1.5	4.993	0.271	5.132	0.271	5.019	0.022	5.456	0.274
200	0.0	5.017	0.123	5.134	0.138	5.179	0.134	5.299	0.152
	0.5	5.062	0.125	5.089	0.135	5.151	0.130	5.274	0.137
	1.0	5.008	0.122	5.085	0.138	5.142	0.133	5.260	0.138
	1.5	4.993	0.123	5.049	0.133	5.095	0.136	5.237	0.140
500	0.0	5.018	0.049	5.051	0.049	5.072	0.048	5.111	0.053
	0.5	5.016	0.053	5.044	0.049	5.053	0.049	5.108	0.054
	1.0	5.003	0.051	5.025	0.051	5.051	0.053	5.114	0.052
	1.5	5.005	0.053	5.019	0.047	5.039	0.049	5.090	0.053

Table 4: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma prior distribution when $\gamma= 3$

n	α_1	β_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
			$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1.5	1	3.015	0.083	3.066	0.087	3.119	0.099	3.275	0.102
		5	2.702	0.056	2.746	0.058	2.798	0.058	2.927	0.068
	3.0	1	3.037	0.085	3.110	0.087	3.170	0.093	3.137	0.100
		5	2.748	0.056	2.785	0.059	2.837	0.066	2.966	0.066
200	1.5	1	3.005	0.045	3.024	0.047	3.056	0.047	3.140	0.045
		5	2.835	0.034	2.873	0.036	2.906	0.038	2.967	0.038
	3.0	1	3.032	0.043	3.059	0.046	3.085	0.047	3.155	0.046
		5	2.866	0.034	2.877	0.034	2.918	0.038	2.981	0.042
500	1.5	1	3.015	0.016	3.010	0.018	3.028	0.018	3.057	0.018
		5	2.934	0.017	2.941	0.017	2.958	0.017	2.980	0.016
	3.0	1	3.015	0.018	3.025	0.018	3.033	0.018	3.075	0.019
		5	2.942	0.016	2.946	0.016	2.969	0.017	2.997	0.017

Table 5: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma prior distribution when $\gamma= 5$

n	α_1	β_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
			$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1.5	1	4.940	0.211	5.042	0.255	5.106	0.244	5.375	0.266
		5	4.122	0.119	4.203	0.108	4.306	0.121	4.476	0.136
	3.0	1	4.965	0.221	5.073	0.259	5.190	0.264	5.429	0.136
		5	4.196	0.115	4.255	0.118	4.360	0.127	4.547	0.131
200	1.5	1	4.952	0.121	5.013	0.111	5.078	0.113	5.174	0.134
		5	4.538	0.084	4.553	0.080	4.601	0.077	4.725	0.089
	3.0	1	5.004	0.114	5.037	0.127	5.093	0.137	5.222	0.130
		5	4.566	0.082	4.588	0.077	4.636	0.085	4.771	0.100
500	1.5	1	4.977	0.047	5.001	0.055	5.025	0.049	5.074	0.052
		5	4.798	0.041	4.807	0.040	4.843	0.046	4.878	0.042
	3.0	1	5.013	0.048	5.027	0.052	5.037	0.053	5.092	0.048
		5	4.804	0.041	4.831	0.040	4.852	0.042	4.907	0.044

Table 6: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma – Chi-Squares prior distribution when $\gamma=3$

n	α_2	β_2	ψ_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
				$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	1.0	2.812	0.0704	2.880	0.081	2.933	0.078	3.082	0.092
		3.0	0.5	2.700	0.059	2.761	0.065	2.815	0.033	2.946	0.071
	2	1.5	1.0	2.811	0.076	2.879	0.085	2.920	0.078	3.077	0.082
		3.0	0.5	2.688	0.061	2.740	0.062	2.785	0.064	2.928	0.068
200	1	1.5	1.0	2.902	0.042	2.951	0.041	2.964	0.042	3.035	0.048
		3.0	0.5	2.839	0.037	2.789	0.036	2.887	0.038	2.980	0.043
	2	1.5	1.0	2.893	0.038	2.925	0.038	2.961	0.042	3.023	0.042
		3.0	0.5	2.838	0.035	2.881	0.037	2.897	0.040	2.972	0.039
500	1	1.5	1.0	2.957	0.017	2.974	0.019	2.993	0.017	3.025	0.018
		3.0	0.5	2.931	0.016	2.946	0.017	2.956	0.018	2.987	0.017
	2	1.5	1.0	2.969	0.018	2.979	0.017	2.985	0.019	3.014	0.019
		3.0	0.5	2.930	0.017	2.946	0.016	2.960	0.017	2.993	0.017

Table 7: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma – Chi-Squares prior distribution when $\gamma=5$

n	α_2	β_2	ψ_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
				$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	1.0	4.515	0.158	4.644	0.183	4.745	0.208	4.940	0.019
		3.0	0.5	4.217	0.117	4.324	0.138	4.397	0.147	4.612	0.148
	2	1.5	1.0	4.507	0.168	4.626	0.186	4.714	0.191	4.928	0.205
		3.0	0.5	4.208	0.129	4.322	0.127	4.39	0.13	4.600	0.152
200	1	1.5	1.0	4.753	0.108	4.805	0.097	4.864	0.116	4.972	0.110
		3.0	0.5	4.612	0.088	4.630	0.096	4.700	0.093	4.808	0.099
	2	1.5	1.0	4.739	0.102	4.788	0.109	4.823	0.106	4.961	0.111
		3.0	0.5	4.573	0.090	4.635	0.096	4.691	0.098	4.790	0.097
500	1	1.5	1.0	4.895	0.046	4.937	0.045	4.928	0.045	4.978	0.047
		3.0	0.5	4.820	0.046	4.847	0.046	4.868	0.045	4.919	0.044
	2	1.5	1.0	4.912	0.048	4.917	0.047	4.931	0.046	4.990	0.051
		3.0	0.5	4.830	0.044	4.845	0.043	4.876	0.043	4.913	0.046

Table 8: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma – Exponential prior distribution when $\gamma=3$

n	α_3	β_3	δ_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
				$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	1.0	2.920	0.075	2.973	0.076	3.031	0.083	3.194	0.097
		3.0	0.5	2.859	0.070	2.908	0.068	2.957	0.075	3.094	0.077
	2	1.5	1.0	2.973	0.081	3.022	0.079	3.060	0.080	3.207	0.086
		3.0	0.5	2.873	0.067	2.927	0.070	2.986	0.076	3.120	0.081
200	1	1.5	1.0	2.966	0.042	2.990	0.041	3.024	0.041	3.103	0.045
		3.0	0.5	2.921	0.038	2.944	0.037	2.974	0.040	3.044	0.041
	2	1.5	1.0	2.983	0.043	2.991	0.039	3.033	0.041	3.107	0.047
		3.0	0.5	2.929	0.039	2.9496	0.040	2.993	0.044	3.062	0.041
500	1	1.5	1.0	2.990	0.017	2.998	0.017	3.011	0.016	3.038	0.018
		3.0	0.5	2.967	0.017	2.977	0.016	2.989	0.016	3.021	0.018
	2	1.5	1.0	2.995	0.017	3.007	0.018	3.01	0.017	3.044	0.017
		3.0	0.5	2.972	0.017	2.983	0.017	3.000	0.017	3.036	0.018

Table 9: Bayes' Estimates of Estimators along with their Mean Square Errors under Gamma – Exponential prior distribution when $\gamma=5$

n	α_3	β_3	δ_1	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
				$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	1.0	4.652	0.178	4.763	0.201	4.829	0.183	5.082	0.198
		3.0	0.5	4.428	0.144	4.543	0.16	4.622	0.154	4.817	0.157
	2	1.5	1.0	4.689	0.169	4.777	0.171	4.883	0.184	5.128	0.214
		3.0	0.5	4.51	0.156	4.601	0.154	4.666	0.149	4.890	0.799
200	1	1.5	1.0	4.819	0.097	4.873	0.103	4.914	0.107	5.030	0.100
		3.0	0.5	4.714	0.097	4.765	0.09	4.797	0.097	4.917	0.099
	2	1.5	1.0	4.854	0.105	4.906	0.113	4.924	0.105	5.070	0.119
		3.0	0.5	4.737	0.096	4.785	0.099	4.817	0.099	4.932	0.103
500	1	1.5	1.0	4.934	0.051	4.935	0.046	4.970	0.051	5.011	0.046
		3.0	0.5	4.885	0.046	4.912	0.045	4.913	0.049	4.966	0.045
	2	1.5	1.0	4.939	0.048	4.950	0.046	4.969	0.049	5.025	0.045
		3.0	0.5	4.874	0.045	4.908	0.041	4.932	0.043	4.969	0.042

Table 10: Bayes' Estimates of Estimators along with their Mean Square Errors under Chi-squares – Exponential prior distribution when $\gamma=3$

n	δ_2	ψ_2	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
			$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	2.983	0.085	2.991	0.075	3.062	0.093	3.214	0.106
		3.0	2.987	0.083	3.030	0.090	3.091	0.086	3.232	0.096
	2	1.5	2.861	0.064	2.932	0.073	2.963	0.077	3.110	0.084
		3.0	2.885	0.080	2.937	0.078	2.995	0.079	3.138	0.079
200	1	1.5	2.968	0.044	2.937	0.078	3.026	0.044	3.106	0.044
		3.0	2.987	0.044	3.020	0.046	3.055	0.049	3.115	0.049
	2	1.5	2.927	0.042	2.958	0.040	2.992	0.043	3.065	0.047
		3.0	2.942	0.042	2.959	0.039	3.008	0.039	3.060	0.043
500	1	1.5	2.992	0.017	3.005	0.019	3.015	0.017	3.036	0.019
		3.0	2.999	0.018	3.012	0.018	3.017	0.016	3.045	0.018
	2	1.5	2.972	0.017	2.985	0.016	2.998	0.017	3.024	0.019
		3.0	2.980	0.018	2.984	0.017	3.001	0.018	3.022	0.017

Table 11: Bayes' Estimates of Estimators along with their Mean Square Errors under Chi-squares – Exponential prior distribution when $\gamma=5$

n	δ_2	ψ_2	$c_2 = 1$		$c_2 = 3$		$c_2 = 5$		$c_2 = 10$	
			$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE	$\hat{\gamma}$	MSE
100	1	1.5	4.759	0.201	4.837	0.211	4.942	0.204	5.191	0.244
		3.0	4.831	0.219	4.910	0.201	4.986	0.228	5.211	0.023
	2	1.5	4.554	0.172	4.660	0.187	4.730	0.164	4.956	0.194
		3.0	4.602	0.160	4.691	0.170	4.732	0.176	4.983	0.201
200	1	1.5	4.879	0.103	4.930	0.108	4.992	0.127	5.088	0.120
		3.0	4.906	0.110	4.952	0.117	5.008	0.117	5.127	0.120
	2	1.5	4.769	0.104	4.831	0.106	4.863	0.106	4.989	0.106
		3.0	4.783	0.096	4.828	0.104	4.874	0.096	5.005	0.1098
500	1	1.5	4.958	0.051	4.957	0.045	4.988	0.05	5.024	0.0469
		3.0	4.953	0.046	4.980	0.051	4.997	0.051	5.026	0.045
	2	1.5	4.907	0.046	4.928	0.048	4.956	0.048	5.000	0.051
		3.0	4.912	0.048	4.935	0.044	4.940	0.047	4.986	0.048

5.0 CONCLUSION

This research work emphasized on the importance of Bayesian approximation using Al-Bayyati's loss function approach. Based on the results presented in Tables 2-11, we see that all the estimated values of the parameters are close to the true values of parameters in Exponential distribution. Bayesian estimates under informative prior distributions proves to be better than the estimates under the non-informative prior distributions proves to be efficient with minimum mean square error.

We conclude that the MSEs based on different prior distributions decreases as the sample size increases. It proves that the obtained estimates for the rate parameter are consistent. We also deduced that the performance of Bayesian estimates under informative prior distributions is better than non-informative prior.

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Comparative Study And Differentiated Pedagogy And The Traditional Or Expositive Method: A Proposal Against School Failure In Brazzaville

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Abstract- Experience shows that our colleges are composed of classes with large heterogeneous groups. Its members come from diverse backgrounds, with different linguistic and cultural heritage and diverse learning habits. This heterogeneity imposes in pedagogy large groups a distribution of tasks and roles, different from those found in the usual classical situations. This heterogeneity imposes on the teacher the adaptation of his or her strategies of communication of knowledge to the heteroclitic nature of the class-group, in other words, opting, for example, for a differentiated pedagogy, whenever possible. It allows individualizing learning, recognizing each student's own personality, and personal attitudes towards learning. This teaching aims at taking into account the sociocultural, cognitive and psychological differences of the pupil, and thus opposes the ideology of the equality of all the pupils before the knowledge, and to the identity myth of the uniformity that vehicles this ideology, which, paradoxically, seems to be at the base of the reflection on the school in black Africa in general and in the Congo in particular. Its main objective is therefore the reduction of school failures, taking into account the heterogeneity of the class-group, and adapting teaching and assessment to the specific conditions of each pupil or group of pupils. It is therefore a question of the educator putting in place motivational processes which make it possible to arouse students' desire to learn. In this momentum, each learner can find a way to access knowledge. Thus the improvement of the relations between teachers and pupils becomes the point of departure for pedagogical efforts.

I. INTRODUCTION

When assessing the Congolese education system according to inequalities, it is very badly placed, because several young people leave the system without any diploma each year. There is therefore a great challenge to propose a system of differentiation of learning giving the possibility to all students to progress in understanding the teachings, including those who want to go very far, because they also suffer from the current system. We have no time for that. The profitability of educational differentiation is to give everyone the opportunity to participate in their own training. On our part, attempting to explain this state of affairs is not a simple exercise, let alone at the national level, when the contexts are not very similar or are in some cases extremely different. These questions are nonetheless important if one wants to understand the

current situation and draw up an inventory of the methods of secondary education. For this, a detour through the history and complex inheritance of high school as well as an analysis of different educational systems and policies and their flaws is necessary. The main objective of this research is to show how important the question of secondary education methods is. Their relevance to the needs of young people and the society they will have to build is indeed fundamental, especially in an international context marked by globalization where the need to take initiatives to move towards sustainable development, fight against poverty, building a society of knowledge are today considered unanimously as our priority to all. In fact, the number of young people attending secondary education has considerably increased in recent years, but the quality of education remains a considerable challenge. In our opinion, it is clear that this can not be achieved without a real policy of reforming methods. In addition, we remain convinced that many institutions that have experienced educational failure because the issue of content and educational strategies were not seriously addressed and that high school generated boredom and dropping out. of a large part of the pupils. Differentiated pedagogy as a teaching strategy is well placed in its difference to the expositive method of providing relief to school failure.

The differentiation of pedagogical action is the result of the recognition of the fundamental responsibility for the dysfunction of the school system in the failure of pupils. It focuses on learning methods, curriculum content and class structuring. Thus, differentiated pedagogy can be one of the possible solutions to the problem of high-class classes, as it allows a distribution of roles, and a diversity of strategies within the class-group, thus offering the teacher the opportunity to break with the traditional immobilism of traditional organizational structures. Nowadays, this active method appears as one of the ways to reduce the school failure in the Congo colleges.

II. THE STAGES OF APPLICATION OF THE DIFFERENTIATION TO THE COLLEGES OF CONGO

We would like to remind you once again that: The differentiation of education, as Beaufrère says, is a necessary condition for the success of all students as long as the audiences they welcome are varied and heterogeneous. It is an approach that implements a diverse set of teaching and learning tools to enable students of different ages, backgrounds, skills and abilities to

reach common objectives. To differentiate one's pedagogy requires diversifying one's pedagogical approaches, the organizational modalities. [1]

Starting from our academic experience and in the pedagogical field, we thought to present some lessons of the literary subjects in different classes of secondary. This work is not an end in itself, but a canvas that can help beginning teachers in the practice of individual differentiation. Here are the different stages of practice of the pedagogy differentiated according to teams-cycles of preschool, primary and secondary which have experienced it:

1.1. First step: Definition of the current situation and a problem (diagnostic evaluation)

Firstly, an analysis of the current situation and the problematic concerning student learning must be carried out. Essentially, it involves making the diagnostic evaluation of the components and relationships of the educational situation.

For example, with respect to the difficulties of a sub-group of four primary cycle pupils in reading, Carlo Nanni, a teacher, might ask himself the following questions: What do I know about attitudes, knowledge, learning processes or metacognitive processes of these four readers? Are my educational interventions adequate to help them? Are they adapted to their prerequisites and characteristics? Are the visual aids presented relevant to them? Have they had enough time to learn? Based on such questions, a diagnostic assessment aims at a better understanding of what impedes learning. [2]

A diagnostic assessment applies, with more or less rigor to some before making the differentiation. The diagnosis of groups of students can be carried from:

- the speed or the quality of the performances (in reading, in computation, in writing, in spelling) ;
- knowledge of certain bases and certain knowledge ;
- the abilities of attention and application skills to abstraction and logical reasoning;
- sensorimotor and concrete skills;
- motivations for school work (at school and at home);
- the capacities of autonomy and responsibility ;
- sociometric choices (increased opportunities to work in teams with some classmates rather than with others);
- the representations of the disciplines and the capacities of adaptation the maturity of the reflections.

1.2. Second step: Definition of the desired situation

Once the current situation is well defined, it is possible to specify the desired situation, what students should learn and what will be initiated or modified, within the pedagogic situation, to contribute to it. A variety of actions, tools or types of interventions can then be envisaged: select certain contents, modify the teaching formulas, create a material or a visual support, adjust the program of activities, vary the modes of grouping, etc. [3]

For example, Mr Carlo Nanni having noticed that his four pupils with reading difficulties do not master word identification strategies because he does not teach them explicitly, he might consider it desirable to accentuate the explicit teaching of such strategies for that they are able to use them properly.

1.3. Step Three: Planning the Action

With Hume we say that Action Planning is the moment when a teacher designs and prepares to implement the changes that are deemed desirable to the teaching situation. For example, for Professor Carlo Nanni, this could be read on explicit teaching, the preparation of some lessons or the reorganization of the schedule to facilitate remedial clinics with the subgroup of students in difficult reading. [4]

1.4. Fourth step: Action

The action corresponds to the effective implementation of planned actions to move from the current situation to the desired situation. In the example chosen, the action would correspond to the moment when Mr Carlo Nanni would teach, as Hume recalls, «explicitly, to the four targeted students, different reading strategies in the context of weekly remedial clinics spread out over eight weeks. " [5]

1.5. Step Five: Evaluating the Action

At the end of any pedagogical differentiation process, it is necessary to evaluate the impact of the actions implemented on student learning. Still related to our example of the difficulties of a sub-group of students in reading, the evaluation stage of the action could correspond to the moment when Mr Carlo Nanni, after eight weeks, would meet his four students to evaluate their degree of acquisition of word identification strategies. If the impact analysis reveals that the actions implemented did not have the desired effect on the learning of the targeted students, another cycle of pedagogical differentiation should be undertaken in relation to the same learning object. For example, Nanni could decide to initiate a new cycle of educational differentiation for one of the four readers whose difficulties would persist despite the initial actions implemented. In our opinion, an action of educational differentiation can be situated on a continuum going from variation to adaptation, according to, in particular, that it is addressed to a greater or lesser number of pupils, that it implies the consultation of a greater or lesser number of stakeholders or modifications, or not, to the requirements of the study program.

III. A BRIEF THEORY OF DIFFERENTIATED PEDAGOGY ACCORDING TO ANN CAROL TOMLINSON.

Our lesson examples are based on Ann Carol Tomlinson's model. Thus we begin by presenting his theory in the context of differentiated pedagogy.

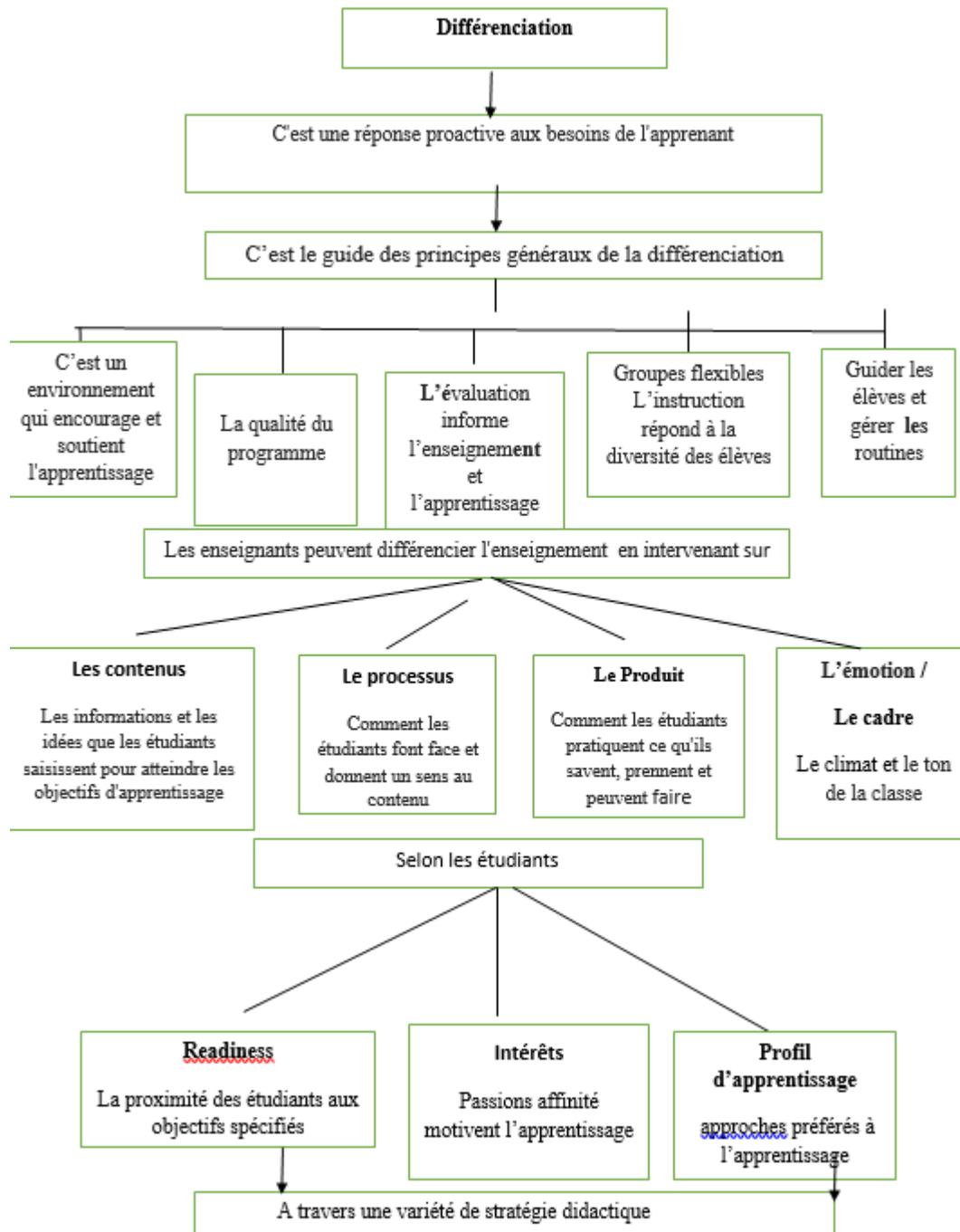
2.1. What is differentiated pedagogy?

According to Ann Tomlinson, differentiation is difference-sensitive teaching. In other words, it means that teachers must proactively plan a variety of approaches based on students' learning needs, how they will learn it, and / or how they will show what they have learned in order to 'increase the probability that each student will learn as much as he or she can, as effectively as possible. [6] At the same time, it is a philosophy and teaching method that respects the needs of students to promote their success. Learning activities can be differentiated on the basis of students ability to learn specific content or skills, their interests or their preferred ways of learning. In a differentiated class, the learning experience of students in many configurations -Work in small groups (with peers having similar or different preparation,

interests, or learning preferences), with a partner, individually, and like a whole group. [7]

According to Tomlinson, differentiated instruction is based on effective pedagogical practice and revolves around several key elements: (see table on next page).

Fig :1 Key elements of effective differentiated instruction



2.2. The high quality curriculum

The high quality program means planning the end in mind. It begins by clearly defining where we want students to go before thinking about how we want them to get there. What do we want them to know, understand, and be able to do as a result of the learning experience? To do this, it is a question of designing a good program by identifying essential Memorandums of Understanding - the concepts, principles, or great ideas of the subject of unity. Understandings that are meaningful, intriguing and provocative of thought allow students to see the relevance of what they are studying to other topics and the world around them. The high quality program allows students to explore important ideas and invites them to develop the necessary skills and attitudes necessary to do rigorous quality work.

2.3. Continuous evaluation

Evaluation is the element that guides teaching in the differentiated class. Using unclassified tests or surveys to pre-assess the readiness and interests of students before or at the beginning of a unit. It will help you determine where each student is connected with the unit and guide in identifying initial student groups and assigning tasks early in the job. Throughout the unit, continuous assessment helps to monitor each student's progress towards learning objectives, and guides the teacher in planning next steps in the classroom. Summative evaluations can also be differentiated based on readiness, interest and learning profile. Hume concludes by saying that it is essential, however, that all summative assessment variables allow students to demonstrate what they have learned in reference to the learning unit. " [8]

2.4. Respectful tasks

Students who come to our classrooms seek affirmation, contribution, challenge, power, and purpose. Respectful tasks meet these needs. In classrooms, it is extremely important that the task we ask students to do is respectful. In a differentiated class, students often work on several tasks simultaneously. Tasks can be adjusted by different levels of preparation, interests or learning preferences, but whatever the task a student is assigned to, it must be respectful.

2.5. Building a community

In an effective differentiated classroom, the teacher focuses on building a learning community where students feel safe, accepted and supported. The one where students treat each other with respect, help each other to be productive. Students have a voice in how the community works and take responsibility for identifying and solving problems in the classroom. [9]

2.6. Flexible grouping

An effective differentiated classroom is characterized by the practice of flexible grouping. This means that students work in a variety of devices - students can work in small groups with students of the same preparation, interest, or learning profile, with a like-minded partner, interest, or learning profile or individually. [10]

2.7. Education

In a differentiated class, all students should work at a level of complexity that is just above their different comfort levels. By providing each student with reasonable levels of challenge and educational scaffolding as needed, students learn that hard work results from successful growth. One trick to achieve this is to plan the most complex activity of learning first is to challenge the most advanced learner in the class. Then modify this activity for students who are currently at lower levels of preparation.

2.7.1. According to Tomlinson, what must remain common for all students :

- *The o learning bjectives:* What students should know, understand and be able to do, it remains consistent for all students in the differentiated class. We do not change the objectives of the lessons and they are the same governed by the national curriculum.

- *Respectful Tasks:* Our goal should be to create tasks that all students would like to get hold of, and our job is to understand how to build the activity - to make it more accessible - for students who need support in the field success of the task. In classes where teachers consistently provide respectful tasks, everyone feels valued, everyone is high.

- *Formative evaluation:* As teachers we have a duty to evaluate the potential of our students. Evaluating where the understanding or knowledge of our students is relative to the learning objectives of our lessons is important for each learner.

- *High attention :* Students sometimes come to see us with complicated problems. We need to keep a look at ourselves so that our expectations do not slip and that we sympathize with these students in their personal struggles. One way of thinking about maintaining high expectations for everyone is in the way you create differentiated missions. Try designing an activity that you imagine your more advanced student could handle and embrace, then, in your replacement tasks, build scaffolding (for example, specify the process steps, provide simpler text material, show examples, encourage English-language learners to do reading or assignment projects in their native language), so that all students can be involved in the same persuasive activity. Remembering to teach "up" will keep high expectations for everyone.

2.7.2. What can or should change base on the interests of learning?

The content: Content is the substance that we provide to help students learn. The lesson has two elements: knowledge, and understanding. Students need to learn how they will access this understanding of knowledge and skills. C A s mentioned above, what we establish as essential for students to learn remains generally constant for students of a differentiated classroom. How students access content, however, can, and often must, vary according to students' levels of preparation. For students in the class to explore systems in one civilization, we could ask a student to read the *Rome Antics* picture book , while another might be looking for a virtual tour of the architecture Jeffersonian inspired by the Greeks and Romans, and yet another can watch a clip from a video about Greek Secrets of the Past. However, knowledge of essential learning, student understanding, and / or skill that should draw from their varied reading generally remain constant. [11]

The process: We can also vary the activities that help students understand. Teachers can design a multi-level assignment

based on readiness or create work options that have an analytical, creative or practical approach. While all versions of the moment have the same essential learning objectives of the task, the pathways to these goals may differ.

The product: The products are the means by which students demonstrate what they have learned after significant training. The richest products are what we often call authentic assessments. As is the case with processes, the essential learning objectives for products rarely vary on students. Beyond that, there is room for great variance in products. Students can choose from the teacher-developed options propose their own options, work in different modes of expression, use different media, or work in different configurations. A good product leads students to demonstrate what they have mastered.

Teaching Arrangements: The differentiated class requires organization and consistency to make students feel safe, but it must remain flexible. This is most evident in grouping configurations. The grouping must be fluid - sometimes a deliberate mix of students with different strengths, other times groups that need specific modifications, and even other groups of times who share similar interests.

IV. DEFINITION OF THE EXPOSITIVE OR MAGISTERIAL METHOD

In this teaching practice, the teacher masters a structured and sacred content. He transmits his knowledge in the form of a lecture: it is the lecture that leaves little room for interactivity with the learner. In the educational triangle of Jean Houssaye [12], this corresponds to the privileged relationship teacher-knowing where the teacher is an expert of the content, a holder of truth that transmits the information unequivocally. It is often difficult in these conditions that the course can learn something, except in the case where it is articulated to other activities that allow real cognitive work.

Thus Alexandre Danielle supports the thought of Jeanne Moll denouncing [13] the type of vertical ratio strongly hierarchical his dice on a transmission of sacred knowledge that considers the student as ignorant. Generally this relationship creates excessive tension between the teacher and the learner.

Table 1: Comparison between traditional and differentiated lesson steps (according to Tomlinson.)

Typical diagram of a traditional learning approach	Typical diagram of a differentiated learning approach
The role of the teacher	The role of the teacher
Motivation	Motivation
Revision	1- Diagnostic evaluation or essential questions (for control of knowledge)
Introduction to the new lesson Explanation by the teacher	2 - Division of groups and assignment of work

	according to the levels or needs of the students.
Some questions or not	3 - Assignment of teaching materials Explanation of the work.
Dictation or copy of the lesson in the exercise books.	
What students do	What students do
Memorizing the lesson	4 - Work by pupils in group or in partnership Control of the groups by the teacher and addition of explanation according to the needs of the pupils. If time is not enough students will continue outside of school hours.
	5 - Presentation of the work of each group to the whole class. (Evaluation)
	<u>Copy of a summary for everyone by everyone</u>
What the teacher does	What the teacher does
Written or oral questioning	6 - Reinforcement students who have not understood the theme of the lesson seen.

Source: Personal evaluation.

V. CONCLUSION

In this comparative study, we realize that the traditional method leaves little space for student participation and favors his limited participation in acquisition of knowledge. The active method is characterized by the application of the principle according to which the subject better learns if he is personally engaged personally whole in an action and the control becomes a self-evaluation of the individuals. It results of the inadequacies of the traditional or school old.

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Footnotes

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Study of Efficient technique based on Entropic Threshold for edge detection in Bone Marrow Images

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Abstract- Thresholding is an important task in image processing. It is a main tool in pattern recognition, image segmentation, edge detection and scene analysis. In this paper, we present a new thresholding technique based on Tsallis and Shannon entropy. The main advantages of the proposed method are its robustness and its flexibility. We present experimental results for this method, and compare results of the algorithm against several leading-edge detection methods, such as Canny and Sobel. Experimental results demonstrate that the proposed method achieves better result than some classic methods and the quality of the edge detector of the output images is robust.

Index Terms- Entropy Threshold, Edge Detection, Shannon and Tsallis Entropy

I. INTRODUCTION

Image Segmentation

Image segmentation procedure is used to extract the key features from the unprocessed input image. Thresholding is a reputed image segmentation technique used to obtain binary image from the gray level image. In the literature, a considerable number of Thresholding procedures are available to segment the Gray scale and RGB images.

In imaging science, image processing plays a vital role in the analysis and interpretation of images in fields such as medical discipline, navigation, environment modeling, automatic event detection, surveillance, texture and pattern recognition, and damage detection. The development of digital imaging techniques and computing technology increased the potential of imaging science.

Image segmentation is one of pre-processing techniques used to regulate the features of an image. Image segmentation is judged as an important procedure for significant examination and interpretation of input images.

In segmentation, the input image is separated into non-overlapping, homogenous regions containing similar objects. Based on the performance appraisal process, the segmentation methods are classified into two groups such as supervised and unsupervised evaluation. Unsupervised methods are preferable in real-time processing because they do not require a manually segmented image.

Thresholding

Thresholding is considered the most desired procedure out of all the existing procedures used for image segmentation, because of its simplicity, robustness, accuracy and competence. If the input image is divided into two classes, such as the background and the object of interest, and is called bi-level Thresholding. Bi-level Thresholding is extended to multi-level Thresholding to obtain more than two classes.

The thresholds can be derived at a local or global level. In local thresholding, a different threshold is assigned for each part of the image, while in global thresholding, a single global threshold the probability density function of the grey level histogram can be handled by a parametric or a nonparametric approach to find the thresholds. In the parametric approaches, the statistical parameters of the classes in the image are estimated. They are computationally expensive, and their performance may vary depending on the initial conditions. In the nonparametric approaches, the thresholds are determined by maximizing some criteria, such as between-class variance or entropy measures. In information theory, entropy is the measurement of the indeterminacy in a random variable[5].

The methods such as Kapur, Shannon, Tsallis, and Otsu are widely adopted by most of the researchers to find solution for multilevel image segmentation problems. In general, Kapur and Otsu based thresholding techniques proved for their better shape and uniformity measures for the bi-level and multi-level thresholding problems.

Traditional methods work well for a bi-level thresholding problem, when the number of threshold level increases, complexity of the thresholding problem also will increase and the traditional method requires more computational time. Hence, in recent years, soft computing algorithm based multi-level image thresholding procedure is widely proposed by the researchers.

Recent literature illustrates that a number of heuristic and meta-heuristic algorithms are employed to segment the gray scale and RGB images.

Edge detection

Edge detection includes a variety of mathematical methods that aim at identifying points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities. The points at which image brightness changes sharply are typically organized into a set of curved line segments termed edges. The same problem of finding discontinuities in one-dimensional signals is known as step detection and the problem of finding signal discontinuities over time is known as change detection. Edge detection is a fundamental tool in image processing, machine vision and computer vision, particularly in the areas of feature detection and feature extraction.

Methodology

Image processing is a general term for the wide range of techniques that are used to manipulate, modify or classify images in various ways. In general, a digital image acquired through digital camera is used for analysis through computers. In the literature, a number of image thresholding procedures are available for gray scale and RGB image segmentation procedures.

The other edge detection procedures such as canny, sobel, and robert are very efficient and successful in the case of bi-level thresholding process. When the number of threshold level increases, classical thresholding techniques produces low quality images.

Sobel Algorithm Method

The operator consists of a pair of 3x3 convolution kernels as shown in Figure 3.1. One kernel is simply the other rotated by 90°[2].

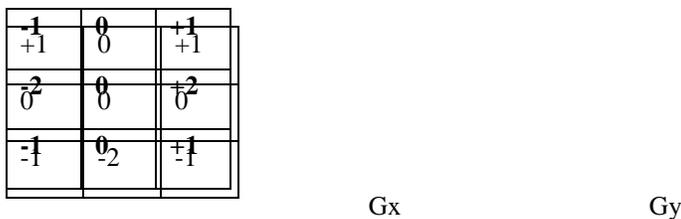


Figure 1.1: Masks used by Sobel Operator

These kernels are designed to respond maximally to edges running vertically and horizontally relative to the pixel grid, one kernel for each of the two perpendicular orientations. The kernels can be applied separately to the input image, to produce separate measurements of the gradient component in each orientation (call these Gx and Gy). These can then be combined together to find the absolute magnitude of the gradient at each point and the orientation of that gradient[3]. The gradient magnitude is given by:

$$|G| = \sqrt{(Gx^2 + Gy^2)} \tag{1.1}$$

Typically, an approximate magnitude is computed using:

$$|G| = |Gx| + |Gy| \tag{1.2}$$

which is much faster to compute.

The angle of orientation of the edge (relative to the pixel grid) giving rise to the spatial gradient is given by:

$$\theta = \arctan(Gy / Gx). \tag{1.3}$$

Robert’s cross operator:

The Roberts Cross operator performs a simple, quick to compute, 2-D spatial gradient measurement on an image[10]. Pixel values at each point in the output represent the estimated absolute magnitude of the spatial gradient of the input image at that point. The operator consists of a pair of 2x2 convolution kernels as shown in Figure 3.2. One kernel is simply the other rotated by 90°. This is very similar to the Sobel operator.

0	+1
+1	0
-1	0
0	-1

Gx
Gy

Figure 1.2 : Masks used for Robert operator.

These kernels are designed to respond maximally to edges running at 45° to the pixel grid, one kernel for each of the two perpendicular orientations. The kernels can be applied separately to the input image, to produce separate measurements of the gradient component in each orientation (call these Gx and Gy). These can then be combined together to find the absolute magnitude of the gradient at each point and the orientation of that gradient. The gradient magnitude is given by:

$$|G| = \sqrt{(Gx^2 + Gy^2)} \tag{1.4}$$

Although typically, an approximate magnitude is computed using:

$$|G| \approx |Gx| + |Gy| \text{ which is much faster to compute.}$$

The angle of orientation of the edge giving rise to the spatial gradient (relative to the pixel grid orientation) is given by:

$$\theta = \arctan (Gy /Gx) - 3\pi/ 4. \tag{1.5}$$

Canny Edge Detection Algorithm:

The Canny edge detection algorithm is known to many as the optimal edge detector. The first and most obvious is low error rate. It is important that edges occurring in images should not be missed and that there be no responses to non-edges. The second criterion is that the edge points be well localized. In other words, the distance between the edge pixels as found by the detector and the actual edge is to be at a minimum. A third criterion is to have only one response to a single edge. This was implemented because the first two were not substantial enough to completely eliminate the possibility of multiple responses to an edge. Based on these criteria, the canny edge detector first smoothes the image to eliminate and noise. It then finds the image gradient to highlight regions with high spatial derivatives. The algorithm then tracks along these regions and suppresses any pixel that is not at the maximum (no maximum suppression). The gradient array is now further reduced by hysteresis. Hysteresis is used to track along the remaining pixels that have not been suppressed[4]. Hysteresis uses two thresholds and if the magnitude is below the first threshold, it is set to zero (made a non edge). If the magnitude is above the high threshold, it is made an edge. And if the magnitude is between the 2 thresholds, then it is set to zero unless there is a path from this pixel to a pixel with a gradient above T2.

Step 1: In order to implement the canny edge detector algorithm, a series of steps must be followed. The first step is to filter out any noise in the original image before trying to locate and detect any edges. And because the Gaussian filter can be computed using a simple mask, it is used exclusively in the Canny algorithm. Once a suitable mask has been calculated, the Gaussian smoothing can be performed using standard convolution methods. A convolution mask is usually much smaller than the actual image. As a result, the mask is slid over the image, manipulating a square of pixels at a time. The larger the width of the Gaussian mask, the lower is the detector's sensitivity to noise. The localization error in the detected edges also increases slightly as the Gaussian width is increased.

Step 2: After smoothing the image and eliminating the noise, the next step is to find the edge strength by taking the gradient of the image. The Sobel operator performs a 2-D spatial gradient measurement on an image. Then, the approximate absolute gradient magnitude (edge strength) at each point can be found. The Sobel operator uses a pair of 3x3 convolution masks, one estimating the gradient in the x-direction (columns) and the other estimating the gradient in the y-direction (rows).

-1	0	+1
-2	0	+2
-1	0	+1

+1	+2	+1
0	0	0
-1	-2	-1

Gx
Gy

Figure 1.3: Masks used for canny operator.

The magnitude, or edge strength, of the gradient is then approximated using the formula:

$$|G| = |G_x| + |G_y|. \tag{1.6}$$

Step 3: The direction of the edge is computed using the gradient in the x and y directions. However, an error will be generated when sum is equal to zero. So in the code there has to be a restriction set whenever this takes place. Whenever the gradient in the x direction is equal to zero, the edge direction has to be equal to 90 degrees or 0 degrees, depending on what the value of the gradient in the y-direction is equal to. If GY has a value of zero, the edge direction will equal 0 degrees. Otherwise the edge direction will equal 90 degrees. The formula for finding the edge direction is just:

$$\theta = \tan^{-1} (G_y / G_x). \tag{1.7}$$

Step 4: Once the edge direction is known, the next step is to relate the edge direction to a direction that can be traced in an image. So if the pixels of a 5x5 image are aligned as follows:

X	x	x	x	x
X	x	x	x	x
X	x	x	x	x
X	x	x	x	x
X	x	x	x	x

Then, it can be seen by looking at pixel "a", there are only four possible directions when describing the surrounding pixels - 0 degrees (in the horizontal direction), 45 degrees (along the positive diagonal), 90 degrees (in the vertical direction), or 135 degrees (along the negative diagonal). So now the edge orientation has to be resolved into one of these four directions depending on which direction it is closest to (e.g. if the orientation angle is found to be 3 degrees, make it zero degrees). Think of this as taking a semicircle and dividing it into 5 regions. Therefore, any edge direction falling within the yellow range (0 to 22.5 & 157.5 to 180 degrees) is set to 0 degrees. Any edge direction falling in the green range (22.5 to 67.5 degrees) is set to 45 degrees. Any edge direction falling in the blue range (67.5 to 112.5 degrees) is set to 90 degrees. And finally, any edge direction falling within the red range (112.5 to 157.5 degrees) is set to 135 degrees.

Step 5: After the edge directions are known, non-maximum suppression now has to be applied. Non-maximum suppression is used to trace along the edge in the edge direction and suppress any pixel value (sets it equal to 0) that is not considered to be an edge. This will give a thin line in the output image.

Step 6: Finally, hysteresis is used as a means of eliminating streaking. Streaking is the breaking up of an edge contour caused by the operator output fluctuating above and below the threshold. If a single threshold, T1 is applied to an image, and an edge has an average strength equal to T1, then due to noise, there will be instances where the edge dips below the threshold. Equally it will also extend above the threshold making an edge look like a dashed line. To avoid this, hysteresis uses 2 thresholds, a high and a low. Any pixel in the image that has a value greater than T1 is presumed to be an edge pixel, and is marked as such immediately. Then, any pixels that are connected to this edge pixel and that have a value greater than T2 are also selected as edge pixels. By following an edge, we need a gradient of T2 to start but we continue until we hit a gradient below T1.

II. METHOD CONSIDERED (TSALLIS AND SHANON ENTROPIES)

The set of all source symbol probabilities is denoted by P, $P = \{p_1, p_2, p_3, \dots, p_k\}$. This set of probabilities must satisfy the condition

$$\sum_{i=1}^k P_i = 1 \leq p_i \leq 1.$$

The average information per source output, denoted S(Z), Shannon entropy may be described as:

$$S(Z) = -\sum_{i=1}^k p_i \ln(p_i) \tag{2.1}$$

being k the total number of states. If we consider that a system can be decomposed in two statistical independent subsystems A and B , the Shannon entropy has the extensive property (additivity)

$$(2.2) \quad S(A+B) = S(A) + S(B)$$

this formalism has been shown to be restricted to the Boltzmann-Gibbs-Shannon (BGS) statistics [9]. However, for non-extensive systems, some kind of extension appears to become necessary. Tsallis has proposed a generalization of the BGS statistics which is useful for describing the thermo statistical properties of non-extensive systems. It is based on a generalized entropic form, where the real number q is an entropic index that characterizes the degree of non-extensivity. This expression recovers to BGS entropy in the limit $q \rightarrow 1$.

$$(2.3) \quad S_q = \frac{1}{q-1} \left(1 - \sum_{i=1}^k P_i^q \right) \quad (2)$$

Tsallis entropy has a non-extensive property for statistical independent systems[1], defined by the following rule:

$$(2.4) \quad S_q(A+B) = S_q(A) + S_q(B) + (1-q) \cdot S_q(A) \cdot S_q(B)$$

Similarities between Boltzmann-Gibbs and Shannon entropy [8] forms give a basis for possibility of generalization of the Shannon's entropy to the Information Theory [6] [7]. This generalization can be extended to image processing areas, specifically for the image segmentation, applying Tsallis entropy to threshold images, which have non-additive information content.

Let $f(x, y)$ be the gray value of the pixel located at the point (x, y) . In a digital image $\{f(x, y)\}$, $x \in \{1, 2, \dots, M\}$, $y \in \{1, 2, \dots, N\}$ of size $M \times N$, let the histogram be $h(a)$ for $a \in \{0, 1, 2, \dots, 255\}$ with f as the amplitude (brightness) of the image at the real coordinate position (x, y) . For the sake of convenience, we denote the set of all gray levels $\{0, 1, 2, \dots, 255\}$ as G . Global threshold selection methods usually use the gray level histogram of the image. The optimal threshold t^* is determined by optimizing a suitable criterion function obtained from the gray level distribution of the image and some other features of the image.

Let t be a threshold value and $B = \{b_0, b_1\}$ be a pair of binary gray levels with $\{b_0, b_1\} \in G$. Typically b_0 and b_1 are taken to be 0 and 1, respectively. The result of thresholding an image function $f(x, y)$ at gray level t is a binary function $f_t(x, y)$ such that $f_t(x, y) = b_0$ if $f(x, y) \leq t$ otherwise $f_t(x, y) = b_1$.

In general, a thresholding method determines the value t^* of t based on a certain criterion function. If t^* is determined solely from the gray level of each pixel, the thresholding method is point dependent.

Let $p_i = p_1, p_2, \dots, p_k$ be the probability distribution for an image with k gray-levels. From this distribution, we derive two probability distributions, one for the object (class A) and the other for the background (class B), given by

$$(2.5 a) \quad P_A: \frac{p_1}{P_A} \cdot \frac{p_2}{P_A} \cdot \dots \cdot \frac{p_t}{P_A},$$

$$(2.5 b) \quad P_B: \frac{p_1}{P_B} \cdot \frac{p_2}{P_B} \cdot \dots \cdot \frac{p_t}{P_B},$$

$$(2.6) \quad \text{where} \quad P_A = \sum_{i=1}^t p_i \quad P_B = \sum_{i=t+1}^k p_i$$

The Tsallis entropy of order q for each distribution is defined as:

$$S_{q,A} = \frac{1}{q-1} \cdot \left(1 - \sum_{i=1}^t P_A^q \right) \quad (2.7 a)$$

and

$$S_{q,B} = \frac{1}{q-1} \cdot \left(1 - \sum_{i=t+1}^k P_B^q \right) \quad (2.7 b)$$

The Tsallis entropy $S_q(t)$ is parametrically dependent upon the threshold value t for the foreground and background. It is formulated as the sum each entropy, allowing the pseudo - additive property, defined in equation (2). We try to maximize the information measure between the two classes (object and background). When $S_q(t)$ is maximized, the luminance level t that maximizes the function is considered to be the optimum threshold value.

$$t^*(q) = \text{Arg max} [S_q^A(t) + S_q^B(t) + (1-q) \cdot S_q^A(t) \cdot S_q^B(t)] \quad (2.8)$$

In the proposed scheme, first create a binary image by choosing a suitable threshold value using Tsallis entropy. The technique consists of treating each pixel of the original image and creating a new image, such that $f_t(x, y) = 0$ if $f(x, y) \leq t^*(q)$ otherwise $f_t(x, y) = 1$ for every $x \in \{1, 2, \dots, M\}$ and $y \in \{1, 2, \dots, N\}$. When $q \rightarrow 1$, the threshold value in Equation (2), equals to the same value found by Shannon's method. Thus this proposed method includes Shannon's method as a special case. The following expression can be used as a criterion function to obtain the optimal threshold at $q \rightarrow 1$.

$$t^*(1) = \text{Arg max} [S_q^A(t) + S_q^B(t)] \quad (2.9)$$

Conclusion

The proposed algorithm used the good characters of each Shannon entropy and Tsallis entropy, together, to calculate the global and local threshold values. Hence, we ensure that the proposed algorithm done better than the algorithms that based on Shannon entropy or Tsallis entropy separately.

III. IMPLEMENTATION OF ALGORITHMS

Procedure Threshold

Input: A digital grayscale image A of size $M \times N$.
Output: The suitable threshold value t^* of A, for $q \geq 0$.
 Begin

1. Let $f(x, y)$ be the original gray value of the pixel at the point (x, y) , $x=1 \dots M$, $y=1 \dots N$.
2. Calculate the probability distribution $0 \leq p_i \leq 255$.
3. For all $t \in (0, 1, 2, \dots, 255)$
 1. Apply Equations (4 and 5) to calculate P_A, P_B, p_A and p_B .
 2. Apply Equation (7) to calculate optimum threshold value t^* .

End

Procedure Edge Detection

Input: A grayscale image A of size $M \times N$ and t^* .
Output: The edge detection image g of A.
 Begin

Step 1: Create a binary image: For all x, y ,
 If $f(x, y) \leq t^*$ then $f(x, y) = 0$ Else $f(x, y) = 1$.

Step 2: Create a mask, w, with 3×3 ,
 $a = (m-1)/2$ and $b = (n-1)/2$.

Step 3: Create an $M \times N$ output image, g
 For all x and y , Set $g(x, y) = f(x, y)$.

Step 4: Checking for edge pixels:
 For all $y \in \{b+1, \dots, N-b\}$, and $x \in \{a+1, \dots, M-a\}$, $sum = 0$;
 For all $k \in \{-b, \dots, b\}$, and $j \in \{-a, \dots, a\}$,
 If $(f(x, y) \neq f(x+j, y+k))$ Then $sum = sum + 1$. If $(sum > 6)$ Then $g(x, y) = 0$ Else $g(x, y) = 1$.

End

Procedure for proposed Algorithm

The steps of proposed algorithm are as follows:

Step 1: We use Shannon entropy, the equation, to find the global threshold value (t_1). The image is segmented by t_1 into two parts,

the object and the background.

Step 2: We use Tsallis entropy, the equation, $q=0.5$, Since, we can write the Equation (6) as:

$$S^A_{0.5}(t) = 2 \sum_{i=1}^t |\sqrt{PA}| - 2 \tag{3.1a}$$

$$S^B_{0.5}(t) = 2 \sum_{k=t+1}^k |\sqrt{PB}| - 2 \tag{3.1b}$$

Therefore, we have

$$t^*(0.5) = \text{Arg max}[(\sum_{i=1}^t |\sqrt{PA}|)(\sum_{k=t+1}^k |\sqrt{PB}|) - 1] \tag{3.2}$$

Applying the equation, to find the locals threshold values (tR 2R) and (tR 3R) of Part1 and Part2, respectively.

Step 3: Applying Edge Detection Procedure with threshold values tR 1R, tR 2R and tR 3R.

Step 4: Merge the resultant images of step 3 in final output edge image. In order to reduce the run time of the proposed algorithm, we make the following steps:

- Firstly, the run time of arithmetic operations is very much on the $M \times N$ big digital image, I, and its two separated regions, Part1 and Part2. We are use the linear array p (probability distribution) rather than I, for segmentation operation, and threshold values computation tR 1R, tR 2R and tR 3R.
- Secondly, rather than we are create many binary matrices f and apply the edge detector procedure for each region individually, then merge the resultant images into one. We are create one binary matrix f according to threshold values tR 1R, tR 2R and tR 3R together, then apply the edge detector procedure one time.

IV. RESULTS AND DISCUSSIONS

Experimental Results

In order to test the method proposed in this work and compare with the other edge detectors, common gray level test images with different resolutions and sizes are detected by Canny, Sobel and the proposed method respectively. The performance of the proposed scheme is evaluated through the simulation results using MATLAB.

Gray-Level Co-occurrence Matrices (GLCMs)

Texture Analysis Using the Gray-Level Co-Occurrence Matrix (GLCM) A statistical method of examining texture that considers the spatial relationship of pixels is the gray-level co- occurrence matrix (GLCM), also known as the gray-level spatial dependence matrix.

GLCM directions of Analysis

1. Horizontal (0 deg)
2. Vertical (90 deg)
3. Diagonal:
 - a.) Bottom left to top right (-45 deg)
 - b.) Top left to bottom right (-135 deg)

Denoted as $P_0, P_{45}, P_{90}, \& P_{135}$ respectively

Ex. $P_0(i, j)$, where i & j are the gray level values are the gray level values (tone) in the image.

Bone Marrow Image 1

Figure 5.1a. Original

Figure 5.1b. Grayscale

Figure 5.1c. Canny

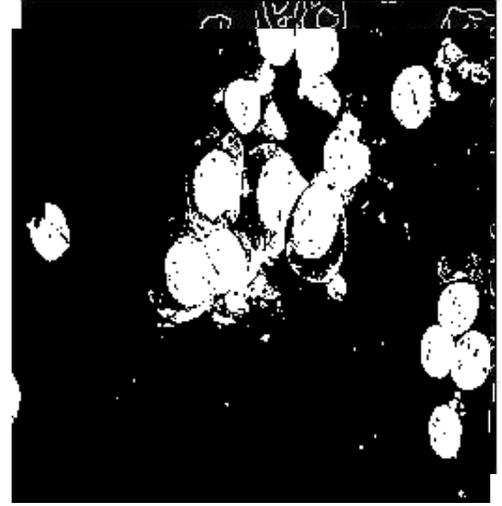
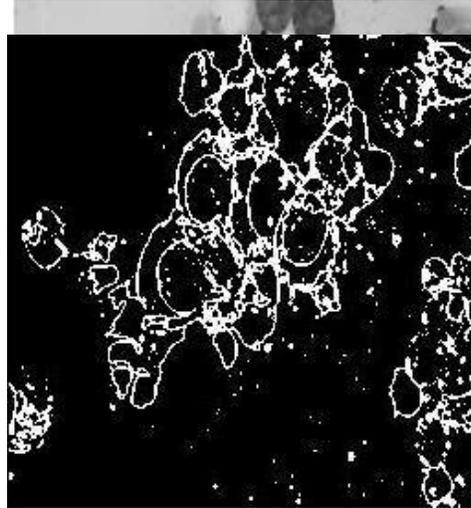
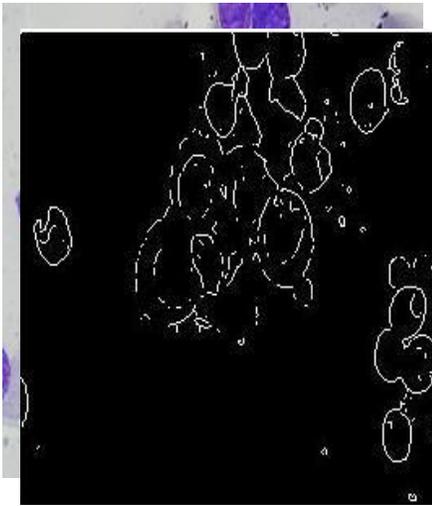


Figure 5.1d. Sobel

Figure 5.1e. Proposed

Figure 5.1f. FeatureEx-

traction

Bone Marrow Image 2

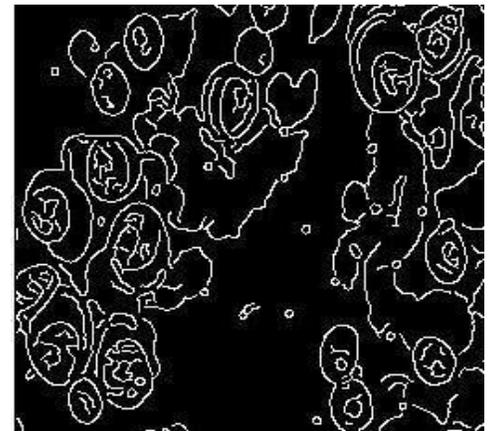
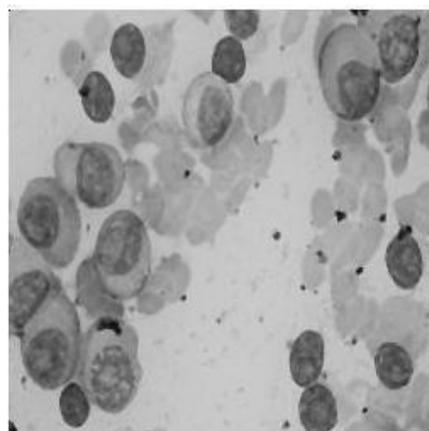
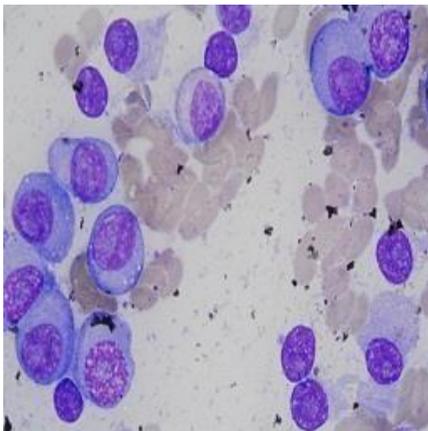


Figure 5.2a. Original

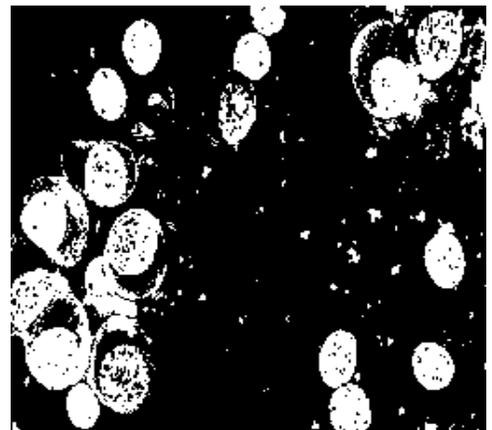
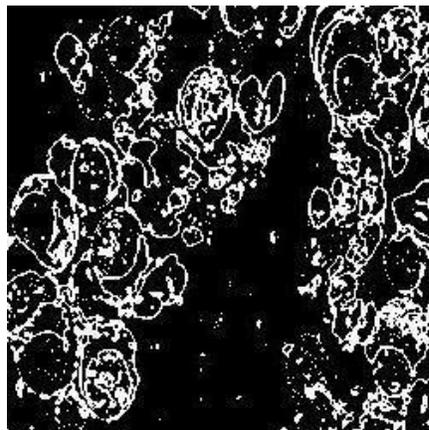
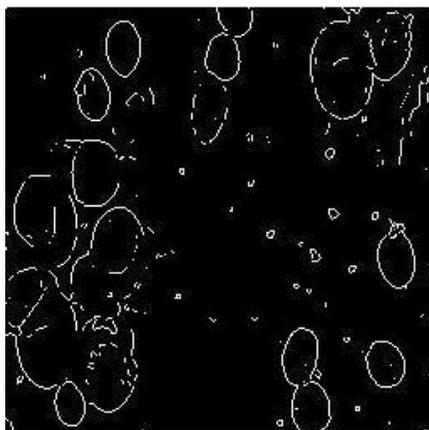
Figure 5.2b. Grayscale

Figure 5.2c. Canny

Figure 5.2d. Sobel

Figure 5.2e. Proposed

Figure 5.2f. Feature Ex-



traction

Bone Marrow Image 3

Figure 5.3a. Original

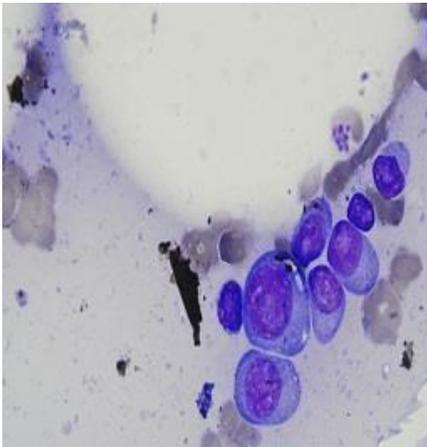


Figure 5.3b. Grayscale

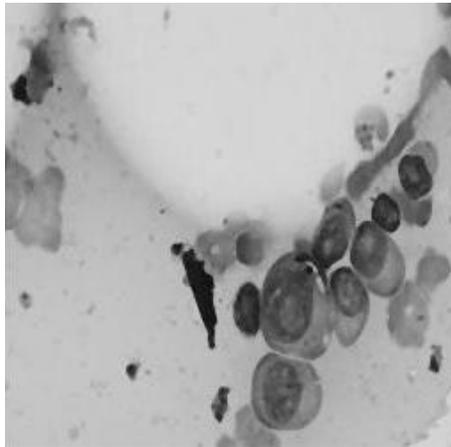
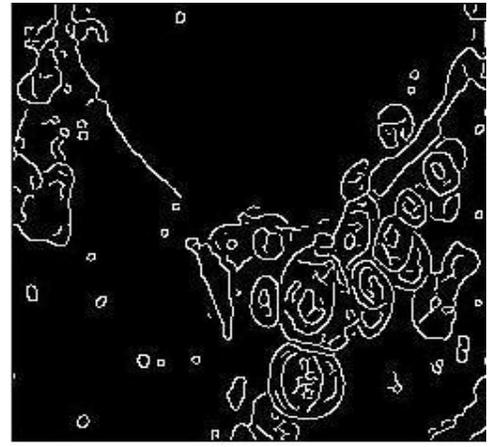


Figure 5.3c. Can-



ny

Figure 5.3d. Sobel

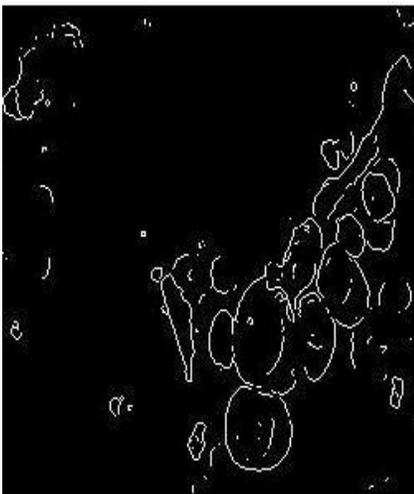


Figure 5.3e. Proposed

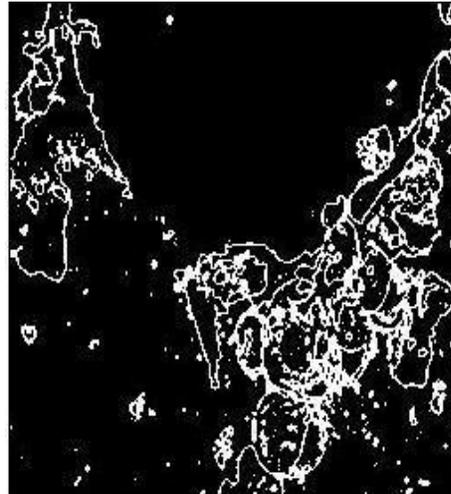


Figure 5.3f. FeatureEx-



tration

Bone Marrow Image 4

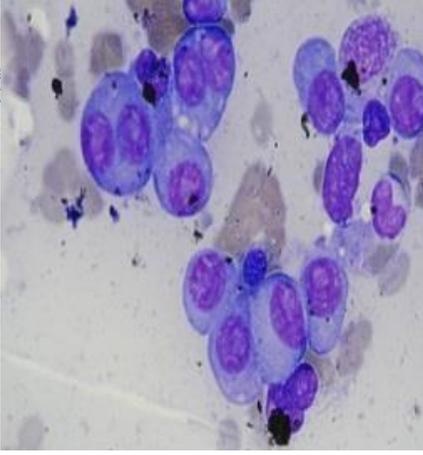


Figure 5.4a. Original

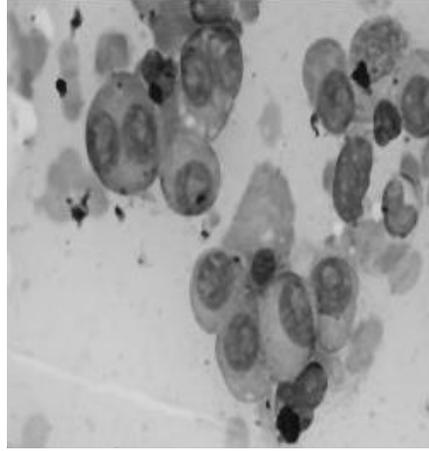


Figure 5.4b. Grayscale

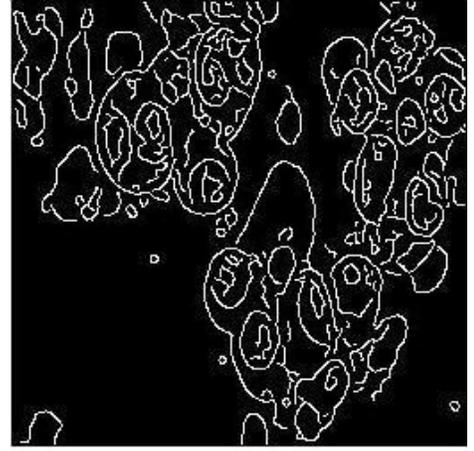


Figure 5.4c.

Canny

Figure 5.4d. Sobel

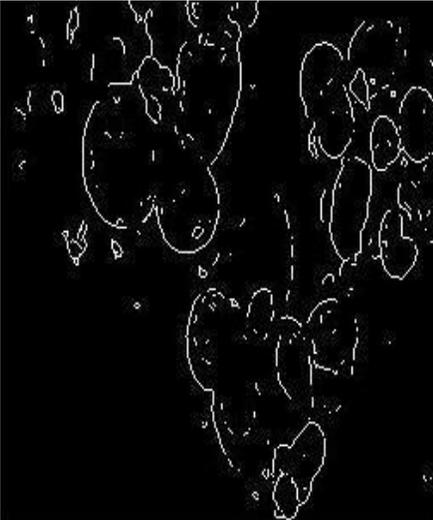


Figure 5.4e. Proposed

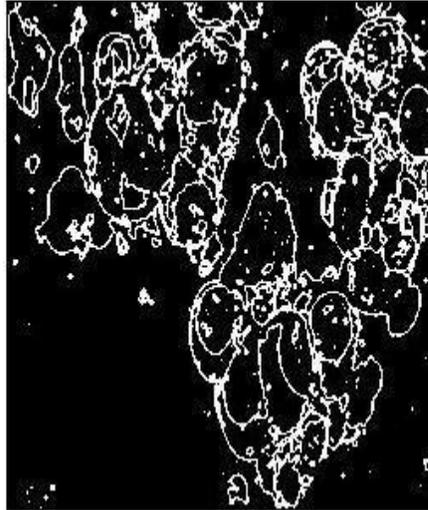


Figure 5.4f. Fea-



tureExtraction

Bone Marrow Image 5

Figure 5.5a. Original

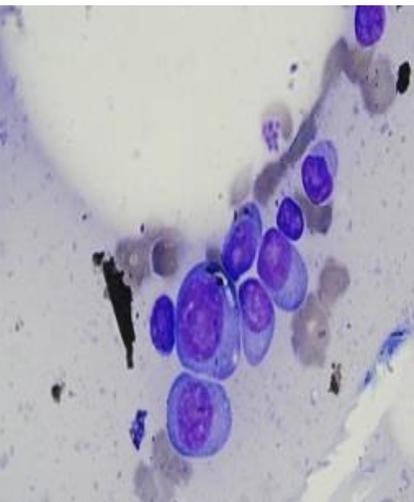


Figure 5.5b. Grayscale

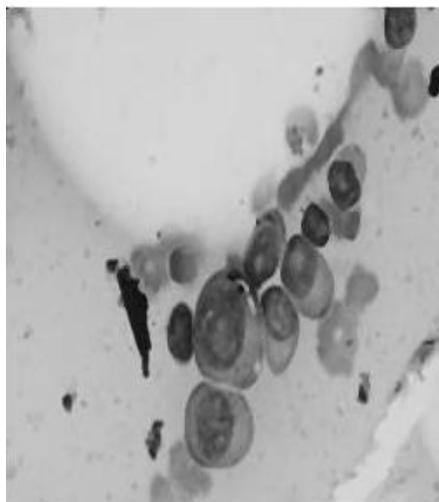


Figure 5.5c. Canny

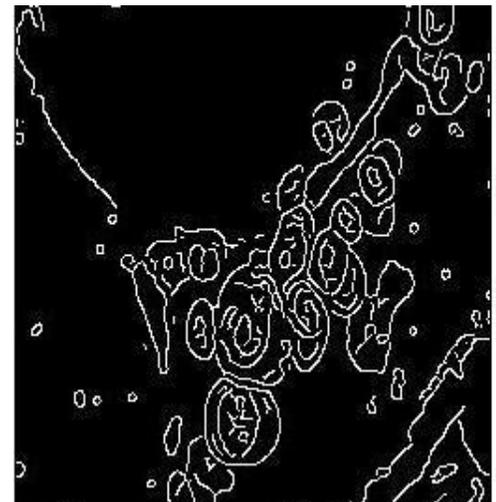


Figure 5.5d. Sobel

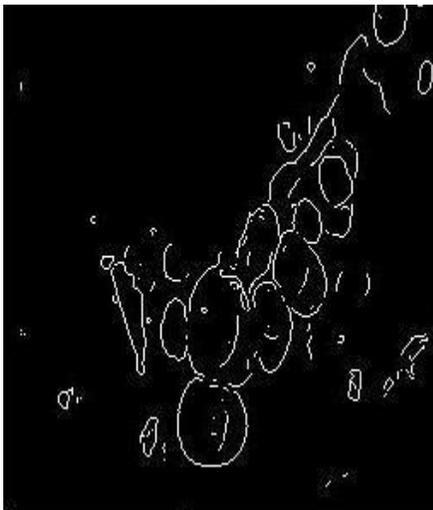


Figure 5.5e. Proposed

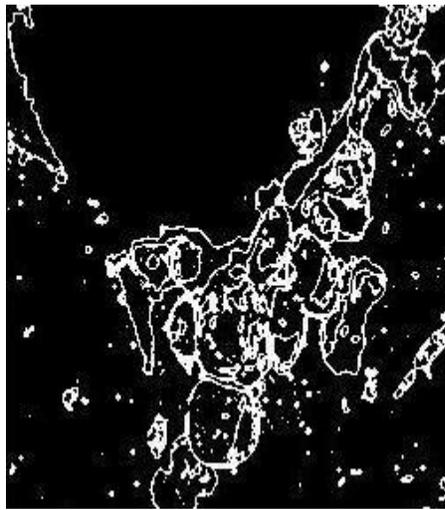


Figure 5.5f. FeatureEx-



traction

GLCM Features

Homogeneity, Angular Second Moment (ASM):

$$ASM = \sum_{i=0}^{G-1} \sum_{j=0}^{G-1} \{P(i, j)\}^2 \tag{4.1}$$

ASM is a measure of homogeneity of an image. A homogeneous scene will contain only a few gray levels, giving a GLCM with only a few but relatively high values of P (i, j). Thus, the sum of squares will be high.

Contrast:

$$Contrast = \sum_{n=0}^{G-1} n \{ \sum_{i=0}^{G-1} \sum_{j=0}^{G-1} P(i, j) \} \quad |i - j| = n \tag{4.2}$$

This measure of contrast or local intensity variation will favor contributions from P(i, j) away from the diagonal, i.e. $i \neq j$.

Entropy:

$$Entropy = - \sum_{i=0}^{G-1} \sum_{j=0}^{G-1} (i, j) * \log p(i, j) \tag{4.3}$$

Inhomogeneous scenes have low first order entropy, while a homogeneous scene has a high entropy.

Correlation:

$$Correlation = \sum_{i=0}^{G-1} \sum_{j=0}^{G-1} \{ (i*j) * P(i, j) - \{\mu x * \mu y\} / (\sigma x * \sigma y) \} \tag{4.4}$$

Correlation is a measure of gray level linear dependence between the pixels at the specified positions relative to each other.

Table: GLCM Features

	IMAGE1		IMAGE2		IMAGE3		IMAGE4		IMAGE5	
FEATURES	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
autocorrelation	1.4854	1.4914	1.5926	1.6027	1.4105	1.4188	1.7248	1.7357	1.4267	1.4322

contrast	0.053	0.0643	0.0839	0.1017	0.0498	0.0618	0.0699	0.0929	0.0444	0.0573
correlation	0.7748	0.8144	0.6982	0.7514	0.7358	0.8023	0.7569	0.8168	0.7773	0
Cluster prominence	1.0761	1.1167	1.0325	1.0856	1.0055	1.056	1.0806	1.136	1.0401	1.0897
Cluster shade	0.6217	0.644	0.5955	0.6261	0.5777	0.6047	0.607	0.6405	0.5975	0.6239
dissimilarity	0.053	0.0643	0.0839	0.1017	0.0498	0.0618	0.0699	0.0929	0.0444	0.0573
energy	0.6544	0.6641	0.5717	0.5857	0.691	0.7006	0.5338	0.5531	0.6885	0.7005
entropy	0.6513	0.6787	0.7901	0.8256	0.5987	0.6262	0.813	0.8651	0.5911	0.6247
Homogeneity	0.9679	0.9735	0.9492	0.9581	0.9691	0.9751	0.9536	0.965	0.9713	0.9778
Maximum probability	0.7954	0.8009	0.7347	0.7432	0.822	0.8272	0.6965	0.7081	0.8195	0.8263

Conclusion

A 256*256 size gray level image is taken for feature extraction. The Digital image features were extracted using statistical second order method. In this work Gray Level Matrix is considered to extract features, which is a statistical method based on the gray level value of pixels. This method was proposed by Haralick[11]. These features are further used in Image segmentation, which are used to identify the regions which are similar and different of sub images. Using this statistical method, we obtained the image extraction in gray-scale level analysis which can be further extended to different algorithms represented theoretically in feature extraction of images.

V. CONCLUSION

The proposed algorithm used the good characters of each Shannon entropy and Tsallis entropy, together, to calculate the global and local threshold values. Hence, we ensure that the proposed algorithm exhibits better results than the algorithms that based on Shannon entropy or Tsallis entropy separately.

It has been observed that the proposed method works well when compared to the previous methods and Sobel (with default parameters in MATLAB)

It has been observed that the proposed edge detector works effectively for different gray scale digital images as compared to that of Canny method.

The hybrid entropic edge detector presented in this paper uses both Shannon entropy and Tsallis entropy together.

As the size of the image for which Texture features are extracted increases the values of all the features proportionally. So the optimum size to be used for extraction is 256 x256 for better resolution and minimum loss of information.

The Gray Level Co-occurrence Matrix (GLCM) method is used for extracting primary Statistical Texture Parameters i.e., Entropy, Angular Second Moment, Correlation etc. By extracting the features of an image by GLCM approach, the image compression time can be greatly reduced in the process of converting RGB to Gray level image when compared to other techniques. These features are useful in motion estimation of videos and in real time pattern recognition applications like Military & Medical Applications.

Traditional methods give rise to the Noise ratio and error. However, the proposed method is used to decrease the noise, error and to generate high quality of edge detection.

Experiment results have demonstrated that the proposed scheme for edge detection works well for different gray level digital images.

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A Comprehensive Study of Gandhian Philosophy of Education

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Abstract- Mahatma Gandhi is one of the most influential philosopher as well as social reformer in the contemporary Indian philosophy. His earlier life was influenced by his mother's religious outlook and this has encouraged him to practice truthfulness, honesty, non-violence for the duration of the whole life. Gandhi is well known in the domain of politics and social reform than in the field of education. Nevertheless, he is one of the greatest teachers of mankind for all times to come "a prophet of its spiritual regeneration. As an ideal educationalist, he tries to reform the existing educational system on the basis of traditional spiritual outlook with the overall development from education which is related to modern age. His philosophical thinking was not fashioned in our academic manner. It was the result of his own daily living, own experience that reflects his own philosophy of life. The basic aim of education is to make a man self-dependent, productive, development of man as well as society. Gandhi emphasised that education is an important means to bring about any social revolution and reform. He also focused on vocational training as well as moral education for the every human being.

Index Terms- Gandhi, Philosophy, Education, Spiritual, Values, Society, Physical, Development and Vocational training etc.

I. INTRODUCTION

Mahatma Gandhi is one of the great thinker, philosopher, and social reformer in Indian history of philosophy. Besides, he is also a great educationist in his own right. He firmly believes that Indian education is unequal to the task of societal change and development. In such a process the need of hour to de-emphasise the material aspects of life on the one hand and on the other, to re-emphasise the spiritual aspects of life, is of great significance. Gandhi is not an educational philosopher in the true sense of the term. He does not conceive of well-knit concept or theory of education, but during the course of a crowded life he made many observations on many facts of education. The objective of proposed research paper an attempt is made try to understand the meaning of Gandhian philosophy of education and its relevance in the present context. While prepared this research paper is purely based on the secondary sources of data.

Philosophy of education pursues an enquiry forms a theory about education its nature and cause, while doing so it tries to make an analysis of the whole field. Philosophy of education can be regarded as the criticism of the general theory of education. In modern times there is need of philosophy of education. Education aims at imparting knowledge, knowledge requires a global outlook

and a synthesis of various types of information and experiences. Philosophy of education played a major role in bringing about revolutionary change and development. In the words of Fichte, "the out of education would never attain complete cleanness itself without philosophy.

"Philosophy of education must be based upon an adequate knowledge of the fundamental facts of the science the formation of aims and purposes towards which educational activity should be directed and the evolution of essential principles and practices and their organization into a scheme of educational programme. The need for such a well considered philosophy of education cannot be over emphasized for its absence makes one either a mechanical fall over of routine or the victim of ill advised and futile innovations."

The concept of philosophy of education is one of the most divisive subjects today in the 21st century. Now in the present age our country as it enters a very competitive global environment. The issue which are paramount concern for all of us are the quality and relevance of education with specific reference to the incessantly changing socio-economic milieu. To build the reserves to meet the challenges of the time and respond to them in a purposeful way is one of the supreme roles of education.

Education has very great role to play for the desired social change which a country needs. Our present system of education is a lopsided affair which consists mainly in the training of the mind. The training of the soul as well as the heart is necessary because it can lead to a refinement of emotions and impulses, it can awaken our deepest feeling of love, constitute non-violence. There is unseen apprehension that modern humanity not guided by ethical values and ideal, may utilise efficient knowledge to destroy its own civilization. There is need of ethical and spiritual values. The prevalent system of education which has behind it, the materialistic philosophy of life, therefore quite alien to our spiritual culture. The need for preservation and inculcation of moral values of human life is keenly felt with as growing sense of urgency all over the world. The great philosopher like Bertrand Russell and Prof. Sarok of Harvard University after Second World War, pointed out that modern civilization cannot survive unless it is inspired by ethical and spiritual values. People all over the world going through 'Values crisis' due to the explosion of science and technology, a clear cut cleavage between science and humanities, population explosion, mans endless quest for effortless material comforts, the manipulating controls exerted by super complex.

Gandhi's philosophy of basic education is comprehensively enough because he looks upon education as an instrument of socio-economic progress, material advancement, political

evolution and moral development for individuals in the society. According to Gandhi, "That which liberates is education". Liberation is of two kinds viz. one form consists in securing the freedom of the country from foreign rule which may be temporary, and the other is the eternal liberation. The system of education which delays our freedom is satanic, sinful and is to be shunned. To him, education means "an all round drawing out of the best in child and man-body, mind and spirit. Literacy is not the end of education nor even the beginning. It is one of the means whereby man and women can be educated. Literacy in itself is no education."² Gandhi's concept of basic education stresses the fourfold development in human personality, namely, body, mind, heart, and spirit. True education stimulates the spiritual, intellectual and physical faculties of the individual. To Gandhi, the clear implication is that meaningful education must not overlook any area of human development.

For the education, Gandhi could prepare only 'self-supporting Primary Education' for the children between the age group of 7 to 14 years. This scheme is known as "Basic Education". It is based on tenets of Truth and Ahimsa. It is aimed at teaching the art of living, to the children and making them useful citizens, equipping them with the qualities of earning their livelihood. Gandhiji himself explained this scheme in his paper 'Harijan' in its issue of May, 8th, 1937. In his concept of basic education basically emphasises some important aspects. These aspects we find that basic education intended at the development of the body, mind, heart and soul. Craft-centred education is one of the important aspects in Gandhi's basic education. He wanted children to learn agriculture or some other craft such as carpentry, blacksmith or some such thing through which he/she could earn his livelihood. He also more emphasises the useful subjects like science, history, geography, ethics, economics, etc. to be taught to children. He also allowed the teaching of literature but not as a necessary or compulsory subject. According to Gandhi, the basic education was intended as at 'a new orientation of subjects so as to eliminate narrow, exclusive, competitive nationalism and to emphasise the ideal of the united world. The basic education of Gandhi was guided by the ideal of self-sufficiency. He himself asserted that "This does not mean that basic education will be self-supporting from the very start. But taking the entire period of 7 years, covered by the basic education by the income and expenditure must balance each other. Otherwise it would mean that even at the end of their training, the basic education will not be fitted for life. That is the negation of the basic education. Nai Talim without the self-supporting basis would, therefore, be like a lifeless body."³

Generally, for Gandhi, the aim of education seems to be vocational. The educational pattern is incompatible with that in home and the knowledge acquired cannot be applied to our daily life. With the mother-tongue as the medium of instruction the same knowledge imparted in twelve years can be imparted in seven years. English as the medium of instruction, impoverishes our languages and creates a gulf between us and our families. We have not coined the correct technical terms in our languages for various scientific terms, neither do we fully understand the English terms. By the time we complete our college education, we lose our mental and physical strength. Gandhi asserts that he is not against Government schools or education, but he is 'against the stamp'. Secondly, there is a lack of character in teachers, and pupils have

no intimate contact with them. There is wastage of time over certain subjects. And lastly, these schools become symbols of our slavery. Gandhi is against expensive education when millions are dying of starvation. "Expansion of the mind will come from hard experience, not necessarily in the college or the school room."⁴

Gandhi has also suggested three remedies to the existing system of education. The rich ought to contribute money towards buildings and equipment, the educated Indians ought to place their education at the disposal of the community free of charge, and the parents should take real interest in their children's education. In this connection, Gandhi, praises the Roman Catholic community in which those who engage in teaching render free services, accepting only what is necessary for their maintenance. These mature teachers remain unmarried in order to devote all their time to the single job of teaching.

Gandhi praises the ancient Indian system of education as the real education in which the village teacher in the elementary stage imparts to the students the necessary knowledge for their occupation. Those who opted for higher education studied *arthasastra* or the science of wealth and ethics as well as religion or *dharma-sastra*. Education was not controlled by the state and the *Brahmins* who were in charge of education formulated the system with the welfare of the people as the aim and based it on restraint and celibacy. Due to such a system of education Indian civilization had outlived so many vicissitudes, and Indians have the inner force that enables them to reject any other culture imposed by the rulers. It is also possible for Indians if they follow this tradition of the sages to transmit this message of love. In the words of Gandhi, "The practical knowledge boys in Indian possess is not due to the education they receive in schools, but is due to the unique Indian way of life. It is due to the meritorious deeds of our ancestors that we find healthy standards of behaviour, thrift, etc., around us, in spite of the repeated inroads of modern growing selfishness."⁵

Education must aim at building character which can be done only through religion. But before a child learns about liberation or moksa, he must be allowed to a certain extent to have attachment to his body and the world around him in order to understand their transitory nature as well as to realise that his body has been given not for self-indulgence but for liberation. Similarly, the child must be mature enough to learn the doctrine of ahimsa or perfect love. Education of the heart is possible only by the personal influence of the teachers. Thus the primary school teachers must be patriotic and should not be those who are unable to find any other job. Since childhood is the most important period in which knowledge acquired is never forgotten. Primary education must be given by "well educated and experienced teachers of high character, in surroundings which would reflect some regard for the beauty of nature and safeguard the health of the pupils, we should see good results in a short time.

Gandhi is of the firm opinion that students must have a clear understanding of their national role in a developing country, but, at the same time he is totally against student participation in the active politics. This is on the consideration that students are used as tools by vested who so use them. To Gandhi, power politics and students responsibilities did not conform with the role he envisages for the student community of the country. To him, what students are taught and what they learn in the temples of learning are of greater concern than anything else. Probably he feels that if

students are given the right type of training through a good system of education, then they will be in a position to develop their personalities and play a significant part in nation-building activities.

The Gandhian concept of basic education in its totality is conceived schematically in terms of its components like theory, content, programmes, methods and goals. Gandhi's theory of education is firmly rooted in some of the highest values which constitute the basic philosophy of his life. The moral imperatives of truth and non-violence are the main concerns throughout his life. He believes that truth can be realised only through non-violence. Gandhi equates truth with God. Truth and non-violence are inter-changeable terms to Gandhi. He lays great emphasis on the necessity of training students for manual work under the supervision of teachers. He takes the position that education is the sum total of all the techniques and processes through which individuals develop abilities, attitudes, aptitudes, as positive values for the development of a progressive society. Gandhi opines that education involves a proper emphasis on right feelings, perceptions, insights and creative fashion.

Gandhi's concept of basic education aims at the all round development of human personality. He does not neglect the bread and butter aspects of education. But his primary emphasis is on the three H's (Head, Heart and Hand) rather than the 3 R's (Reading, Writing and Arithmetic). According to Gandhi, the true developments of the mind and the heart with a corresponding illumination of the soul are necessary for a satisfactory system of education. During his life time he severely criticised the prevailing educational system as 'wasteful and positively harmful'. He said that modern education means that "body are lost to the parents and to the occupation" to which they are born, they pick up evil habits, affect urban ways and get a smattering of something which may be anything but education. What then should be the form of primary education? I think that the remedy lies in educating them by means of vocational and manual training.

Gandhi says that his ideas about education are very exacting and wants the teachers to meet once a week to exchange ideas to facilitate innovations. Secondly, intelligent students should be consulted and their suggestions should be invited regarding the methods of teaching. The students' health is the collective responsibility of the teachers, the main responsibility rests with the teachers of hygiene.⁶ In the words of Dr. Patel, "Gandhiji's philosophy of education is naturalistic in its setting or idealistic in its aim and pragmatic in its method and programme of work. All these tendencies are not separate in his philosophy. These fuse into a unity, giving rise to a theory of education which would suit the need of the day and satisfy the loftiest aspiration of the human soul". Gandhiji's philosophy of education has the basic aspects namely psychological, physical development, sociological and economic aspects. From the psychological point of view it balances the intellectual and practical elements of experience and may be made an instrument of educating the body and the mind in co-ordination. From the sociological point of view it will conduce to a true sense of the dignity of labour and of human solidarity,

which have the value from the ethical and moral point. It develops the co-operation, brotherhood and service which would help for a peaceful life in society. From the economic point of view, the Gandhian scheme of education gives greater reality to the educational process by making economically self-sufficient and developing in the children the qualities of self-reliance and independence.

II. CONCLUSION

From the above discussion we can say that the Gandhian philosophy of education is the ideal one, economical at the same time very practicable and universal in its application. It is the best system for imparting general education. As Gandhi himself points out, provision should be made to cater to the needs of special aptitudes. We have found some vital aspects in his philosophy of education namely psychological, physical development, sociological and economic aspects. Moreover, basic education is co-operative because it tries to integrate the individual with the society in a spirit of co-operation. It is also non-violent in its implications. The physical, mental and spiritual growth of individuals is sought to be achieved through non-violent means. Basic education also places truth on a high pedestal. In this noble task of education the absolute standard of truth and goodness may serve worthy causes. These are primary virtues of basic education.⁷ Now, in modern times the Gandhian basic education can act as a powerful instrument for development of a better citizenship. Gandhi's philosophy of education must be put into practice so that human spirit can flourish in its supreme manifestation.

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Effects Of Training As An Aspect Of Preparedness Of First Responders On Efficacious Response To Terrorist Attacks

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Abstract: Inefficacious response to terrorist attacks in Nairobi County is regularly evident in accounts of inadequate preparedness of response organization. Infighting, incompetence and long duration taken for response to attacks is recurring and costs for not addressing their preparedness level is high. This article endeavored to assess effects of training as an aspect of preparedness of First Responders on efficacious response to terrorist attacks. Findings revealed that level and type of training had effect on the preparedness of First Responders during terrorist attacks. There is no standard and coordinated training between Response organizations since they are trained to perform different roles.

Keywords: *Efficacious response, preparedness capacity, terrorism*

Introduction

Although multilateral instruments against terrorism have existed since 1960's, the unprecedented reach and potential terrorists network such as Al-Qaeda, ISIS and its affiliates constitute a new danger that challenges standing tools and institutions (Jaffin & Bob, 2008). Yet pursuing a regional approach involving all stake holders in security matters is fraught with challenges. This calls for new and innovative preparedness strategies for effective response to terrorist attacks, and hence the need for this article. According to Cooper (2011), the international counter-terrorism regime continues to suffer from weaknesses such as inadequate compliance and enforcement of existing instruments and limited resources and expertise. For instance, the November 2015 Paris in France where a series of coordinated terrorist attacks occurred, in the city's northern suburb, Saint-Denis. Beginning at 21:16 pm, three suicide bombers struck outside the Stade de France in Saint-Denis, during a football match. This was followed by several mass shootings and a suicide bombing, at cafés and restaurants. Gunmen carried out another mass shooting and took hostages at an Eagles of Death Metal concert in the Bataclan theatre, leading to a stand-off with police. Attackers blew themselves up when police raided the theatre killing 130 people and injuring 100. The attacks were the deadliest on France and the European Union since the Madrid train bombings in 2004 (Faiola & Mekhennet, 2016). Shortly after the attacks, intelligence staff in multiple countries began to review electronic surveillance recorded before the attacks. It was confirmed that the French National Police met with German police and intelligence services a month before the attack to discuss suspicions that terrorists were staking out possible targets in France (Dickson, 2016).

In Africa, emerging security threats of nation states have become a source of challenge for most governments. Further complicating the security landscape is the increase in the outbreak of transnational terrorism that feeds into terrorism loop in Africa (Fisher & Richard, 2006). The growing threat of Al-Shabaab in Somalia and Boko Haram in Nigeria made Africa a region of growing terror concerns (Mona, 2015). On 14 October 2017, a massive blast caused by a truck bombing in Mogadishu, the capital of Somalia, killed at least 587 people and injured 316. The truck was detonated after it was stopped; the actual target of the attack is believed to have been a secure compound housing international agencies and troops. Though no organization claimed responsibility, officials stated that a key member of the cell that carried it out told them Al-Shabaab was responsible (Higgin & Starkey, 2015).

In Nigeria, Boko Haram's worst terror attacks includes; 2010: Killing of 75 people in suicide bombings and assassinations; freed nearly 700 inmates in a prison break. Aug. 26, 2011: Car bomb at U.N. headquarters in Abuja killed 23, injured 81. Sept. 17, 2013: Gunmen in military fatigues used illegal checkpoints to kill 142 civilians in Beni Shiek village. April 15, 2014: Abducted 276 schoolgirls in Chibok. Leader Abubakar Shekau threatened to sell them as brides or slaves. Jan, 3: Up to 2,000 people killed in towns

of Baga and Doron-Baga (Basse & Nnimmo, 2006). For instance, various responses has been adopted to combart transnational terrorism when military operations are deployed in Somalia and Nigeria but still terrorism pervades Africa, thus need for new approach in understanding the preparedness capacity of First Responders on efficacious response to terror incidents (Nossiter, 2011).

Kenya has not been exempted in the terrorist attack trends since its deployment of troops to Somalia in pursuit of al-Shabaab, the al-Qaida-linked Somali militant group that has abducted foreign aid workers and tourists in Kenya On October 14, 2011. Since its October intervention in Somalia, militants have executed a number of terrorist attacks in Kenyan territory. Although authorities blame Al-Shabaab for much of the violence, it has also become clear that Kenya has a domestic radicalization problem of its own. Kenyan nationals have conducted a number of recent terrorist attacks in Kenya, with many of them receiving military training from Al-Shabaab in neighboring Somalia (Mogire & Agade, 2011).

In late 2014, two attacks believed to have been carried out by Al Shabaab killed 64 persons in Mandera County. On 22 November 2014, gunmen attacked a bus traveling from Mandera to Nairobi, killing 28 persons, mostly teachers and government workers heading to Nairobi for the December holidays. On 2 December 2014, Al-Shabaab militants attacked and killed a further 36 quarry workers, many of whom were non-Muslims, near Mandera town (Macharia & Miriri, 2013). Following Al-Shabaab's latest attack in Mandera County, experts and ordinary civilians stressed that a revamp of the entire security architecture and roles of First Responders was urgent to defeat terrorism.

In April 2015, gangsters stormed the Garissa University College, killing 147 people and wounding several others. The attackers claimed to be from the Al-Shabaab militant group, and indicated that they were retaliating over non-Muslims occupying Muslim territory. The militants took several students hostage, freeing Muslims but withholding Christians. Over 500 students were in distress in the siege that took fifteen hours (Mutambo & Hajir, 2015). Akin to Westgate attack, reports suggest that members of Kenya's security apparatus were provided forewarning of an imminent al-Shabaab attack. In addition to a number of foreign government agencies either issuing specific warnings or changing their travel advisories for the country, a number of Kenyan universities advised students and staff to be extra vigilant due to an unspecified threat. Such advisories were even issued in Garissa, where the Garissa Teachers Training College was closed amid concerns about security prior to the attack on the adjacent university campus. Yet despite these warnings, little was done to increase security provisions in a region (Zirulnick, 2015). Security forces were berated for their slow response, it took the country's elite paramilitary unit (General Service Unit) seven hours to deploy to Garissa from their base in Nairobi. By the time they arrived, the majority of the deaths had already occurred (Torchia & Christopher, 2013).

Nairobi County has not been exempted in terrorist attack trends. A bomb flattened the Norfolk Hotel in Nairobi on New Year's Eve, killing 20 people and injuring 80 in the year 1980. An Arab group claimed responsibility, saying it was in retaliation for Kenya allowing Israeli troops to refuel in the capital en route to rescue 100 hostages being held by pro-Palestinian hijackers at Entebbe Airport in Uganda (Aronson & Samuel, 2013). After the attack, Elite Security Consultants (ESC) Officer-in-Charge Worley Reed led the search and rescue efforts for two days along with the ESC staff, other remaining employees and the med unit until professionals from Israel arrived to take over since it was unmanageable by Kenya first responders. Over the weekend, more U.S. government personnel and others, such as the Israelis, deployed to help. The Federal Bureau of Investigation (FBI) arrived to investigate and finds that there was no recordings during the occurrence of the terror act (Nossiter, 2011).

On Saturday 21 September 2013, Al-Shabaab militants stormed Westgate shopping mall, an upscale mall in Nairobi, throwing grenades and firing indiscriminately at shoppers. The subsequent siege lasted 80 hours and resulted in at least 67 deaths and more than 175 people were reportedly wounded in the mass shooting (McConnell & Tristan, 2015). Two weeks on, a detailed investigation based on interviews with survivors, their relatives, security forces and officers involved in the operation reveals how infighting, incompetence and a fatal friendly fire incident undermined the response and left the attackers free to prolong their slaughter (Sageman, 2004). Further political post-mortem, evidence surfaced of how both local and foreign intelligence had provided Kenyan officials with forewarning of a potential al-Shabaab attack in the capital yet little was done to increase security provisions in the city (Hoffman, 2006).

The way these terror attacks were responded to triggered many questions on whether the First Responders were prepared during terrorist attacks or not (Cooper, 2011). Yet, the role of adequate preparedness of First Responders, as well as its ability to facilitate effective response during terrorist attacks is not adequately tackled. Literature on terrorism response reveals a dismal focus on

preparedness of First Responders on efficient response to terrorists attack. Although several measures have emerged to promote security and deter terrorism, there seems to be a discernable gap in how often agencies responsible for first response, prepare its personnel during terrorist attacks (John, 2010). Of much weight is the fact that First Responders to emergencies vary a continuum in terms of organizational strength, their level of dysfunction can represent variable mixture of inadequate preparedness capacity for efficacious response to terrorist attacks.

Training as an aspect of preparedness

Training include tests of the proposed response operations (Alan, 2002). Emergency drills and exercises provide a setting in which operational procedures can be tested. They also facilitate inter organizational contact, thus allowing individual members to better understand each other's professional capabilities and personal characteristics. Furthermore, multifunctional exercises constitute a simultaneous and comprehensive test of emergency plans and procedures, staffing levels, personnel training, facilities, equipment, and materials.

The study of human dealing with training confirms that to have an action to be second or done without thinking, you must do that action thousands of times. Police are trained in drawing and firing their weapons over and over so that when they are in fight a flight mode, they draw the weapon come directly in target, and fire until the thread is neutralized. The training is refreshed each time an officer goes for fire aims recertification. In Kenya, we give the emergency security personnel basic training and not basically refreshing them on evolving security threats like terrorism response in relation to changing trends. They are not experienced in doing anything other than traditional firefighting duties (Fisher & Richard, 2016). Enhancing coordination with the private sector is critical for ensuring the preparedness of the Nairobi County for protecting vital infrastructures (utilities and transportation). The 2013 West Gate attack in Nairobi survey provides indication of how much coordination is occurring between emergency responders and the private sector. This limited interaction with the private sector, either in sharing threat information or in participation in joint preparedness activities that is: planning and training contributes to confusion during response to terrorism since every organization operates differently thus contributing to inadequate response due to lack of preparedness (Deflem, 2006).

Organizational culture

An organizational culture determines how individual within the organization behave and how they expect others to behave. More importantly, it drives the way the organization conduct business and interacts with the wider community (Pape & Robert, 2003). Consequently, Alan (2002) argues that organizational culture can hamper effective cooperation between agencies. With time, an organizational culture can create an even more complex set of rules and encompass a wider set of beliefs that discourage agencies within First Responders community from even seeking to share training (Alan, 2002).

Absence of central body to coordinating response

Different security departments in disaster management have tended to react to disaster situations in their own departmental way in disregard to the benefits of a systematically coordinated approach. Within the various actors, each has its own strengths and weaknesses that determine the success or failure of the techniques they employ in disaster management and risk reduction (Decker & Russell, 2011), have argued, institutional complexities complicate complex emergencies still further while in some cases, aid has fuelled conflict due to poor coordination for efficacious response to terrorists attack. That disaster management agencies in the country doesn't deliver their services in a systematic manner to avoid confusion at a time when coordination is most crucial for success in Nairobi County, since individual response agencies developed their protocols separately, and subsequently developed their terminology separately. This can lead to confusion as a word may have a different meaning for each organization (Decker & Russell, 2011)

It was the beginning of a chaotic and what many Kenyans now call a bungled reaction by the national security services to one of the most chilling terrorist attacks this country has ever suffered, in which more than 60 men, women and children were killed. Police officers and soldiers could not communicate with each other their radios were on different frequencies. Rescuers did not have blueprints for several hours, relying instead on printouts of rough floor plans from the Westgate Web site that is, when it had not crashed as people around the world overloaded the site thus giving the assailant's time on their hands to kill civilians (Kangethe, 2013).

Systems model

A system is defined as a grouping of parts that operates together for a common purpose. Behavior of each element affects the behavior of the whole. There are six elements of a system consists of boundary, environment, observable interactions, sub: system, control

mechanism and emergent properties (Baird, 2010). Terrorism occurrence can highlight the efficiency of the governmental system because the authority in charge, are facing the short time and the limited sources while they are being forced to continue to help the victims. Because terrorism reveal not only the structural strengths and limitations of the physical environment of a community but also how local, state and national response organizations function effectively and ineffectively. Therefore, the countries which have not structured comprehensive and strategic plan would be confronting more problems than other countries.

In spite of terrorism unpredictability, the governments can be prepared beforehand in order to cope with incidents. Recent terrorism had significant impacts on people's health and the loss of people's lives which could be controlled by appropriate management techniques. Intervention by the absence of comprehensive and fundamental planning will have unpredictable, unexpected and subsequently unaccepted consequences (Sublette & Carey, 2014). Services are found disrupted right at the time they are most needed, so strategic planning has to include some solutions in order to minimize these types of operation disruptions in times of crisis and disasters. Strategic planning provides the appropriate infrastructure for integrated, coordinated decision making following disasters such as terrorism. Hence, applying Strategic planning to disaster management can reduce the impact of terrorism on the community which results in reducing the number of casualties and disabilities. As emergency and crisis management imply, an effective emergency response and recovery operation in terrorism requires establishing vital collaborations and communications within the system and between the system and its environment. A major contribution of the strategic planning process to emergency and disaster management is the necessity of monitoring the nature and changing character of external forces and their impacts on the operations of an organization. Emergency planning is most likely to be successful when it is viewed, either explicitly or implicitly, from a systems perspective (Luhmann & Nikla, 2004).

Methods and material

Study area

The study was conducted in Nairobi County which is the capital city of Kenya. The city is situated at 1°09'S 36°39'E and 1°27'S 37°06'E and occupies 696 square kilometres (270 sq mi). Is situated between the cities of Kampala and Mombasa, and adjacent to the Eastern edge of the Rift Valley. It has the population of 4,000,000 people (Nairobi City, 2010). Nairobi is divided into a series of constituencies which are: Makadara, Kamukunji, Starehe, Langata, Dagoretti, Westlands, Kasarani, and Embakasi. The main administrative divisions of Nairobi are Central, Dagoretti, Embakasi, Kasarani, Kibera, Makadara, Pumwani, and Westlands (Nairobi City data, 2010).

The city is the regional headquarters of several international companies and organizations. In 2007, General Electric, Young & Rubicam, Google, Coca-Cola, IBM Services, Airtel, and Cisco Systems relocated their African headquarters to the city. The United Nations Office at Nairobi hosts UN Environment and UN-Habitat headquarters. Several of Africa's largest companies are headquartered in Nairobi. Ken Gen, which is the largest African stock outside South Africa, is based in the city. Kenya Airways, Africa's fourth largest airline, uses Nairobi's Jomo Kenyatta International Airport as a (Ranter, 2017). Presence of these amenities predisposes the city to terrorist attacks because of western interest.

Research Design

Researcher used descriptive survey research design in making a detailed examination since the study population was homogeneous in nature where by both qualitative and quantitative research techniques were applied. This design was bend in the study to obtain information concerning the current status of the phenomenon to describe what exists; with respect to specific variables or conditions in the situation. Kombo & Tromp, (2006) describes descriptive research design as a systematic empirical inquiry into which the researcher does not have direct control of independent variables as their manifestation has already occurred or because they inherently cannot be manipulated.

Sample size

Sample size was purposively sampled from various key informants from various institutions including: Kenya Police (General Service Unit and Anti-Terror Police Unit), National Intelligence Service, hospitals, St John's Ambulance and fire brigades. The sample size for the study included; 22 Nairobi county fire brigade, 50 emergency medical technicians from both private and public hospitals and 76 Kenya Police (GSU and ATPU) from state actors. 22 from St. John's Ambulance and 33 National Intelligence service was selected as non- state actors. The total sample size for the study was 203.

Data collection instruments

Qualitative and qualitative data was collected through a household survey questionnaire, key informant interviews and focus group discussion were administered personally by the researcher. Observation was used to corroborate information collected using the three data instruments. Data collection instruments were developed after analysis of similar studies through literature review, deliberations with practitioners in this field.

Data analysis

Both quantitative and qualitative methods were used for data analysis. Quantitative data from the questionnaire were coded and entered into the computer for computation of descriptive and inferential statistics. Statistical Package for Social Sciences (SPSS) was used to analyze collected data.

RESULTS AND DISCUSSION

Deficiency of First Responders training in relation to response to terrorist attacks

On aspect of training, responders were asked to rank their training level in relation to response to previous terrorist attacks in Nairobi County. Table 1 shows their response.

The responses were on a likert scale where VI = means very important, I= important, LI=less important, NA=no association and NS= not sure.

Table 1: Deficiency of First Responders training in relation to response to terror attacks

Terror attack	VI	I	LI	NA	NS
Norfolk hotel bombing,	40	117	0	0	13
West Gate mall attack, September,2013	124	44	0	0	2
United States Embassy attack	52	111	0	0	7
Mfangamano Lane, Mwaura’s Pub October, 2011	28	113	7	3	19
OTC bus station,October,2011	26	117	3	7	17
First Avenue Eastleigh, Nov-Dec, 2012	29	119	8	3	11
Machakos bus station, March,2012	47	103	5	2	13
Gikomba Market, May,2014	29	114	7	3	19
Dusit D2, 14 Riverside drive, Westlands, January 2019	19	3	4	140	4

Source: Field data (2019)

It is noted that training include tests of the proposed response operations. As noted above, emergency drills and exercises provide a setting in which operational procedures can be tested. They also facilitate inter organizational contact, thus allowing individual members to better understand each other’s professional capabilities and personal characteristics. Furthermore, multifunctional exercises constitute a simultaneous and comprehensive test of emergency plans and procedures, staffing levels, personnel training, facilities, equipment, and materials (Ketcham & McGeorge, 2012).

The response on this aspect was based on the level of response of First Responders to terror attacks that had occurred in Nairobi County. Findings from this study showed that response to Norfolk hotel bombing was affected by deficiency with First Responders training. This was represented by a high response rate of 117 respondents (69%) who supported that training was important. A closer number of respondents (40) 24% agreed that training was very important for effective response to terror attacks by First Responders which due to poor training led to inadequate response. (13) of the respondents represented by (8%) indicated that they were not sure on this aspect. According to Nossiter (2011), that after Norfolk hotel bombing, Elite Security Consultants (ESC) Officer-in-Charge Worley Reed led the search and rescue efforts for two days along with the ESC staff, other remaining employees and the med unit until professionals from Israel arrived to take over since it was unmanageable by Kenya first responders. Over the weekend, more U.S. government personnel and others, such as the Israelis, deployed to help. That there was deficiency with First Responders training.

Majority of the respondents 124 (73%) indicated that First Responders to terror attacks had deficiencies in training indicating that it was very important in relation to West Gate mall attack. They were supported by 44 (26%) indicating that training was important and due to its deficiency led to inadequate response to West Gate mall attack. 2 (1%) of the respondents were not sure on this aspect. Basing on the findings, McConnell & Tristan, (2015) affirms that the subsequent siege lasted 80 hours and resulted in at least 67 deaths and more than 175 people were reportedly wounded in the mass shooting. Two weeks on, a detailed investigation based on interviews with survivors, their relatives, security forces and officers involved in the operation reveals how infighting, incompetence and a fatal friendly fire incident undermined the response and left the attackers free to prolong their slaughter (Sageman, 2004). The way these terror attacks were responded to triggered many questions on whether the First Responders were trained to respond to terrorist attacks or not (Cooper, 2011).

In response to United States Embassy attack, approximately 212 people were killed, and an estimated 4,000 wounded (Bennett & Brian, 2011). The attack showed the link between training and efficacious response to terror attacks by First Responders.

Study findings indicated that 31% (52) of the respondents agreed that training was very important basing on the fact that response to U.S Embassy attack was poor due to deficiencies with First Responders training. Majority of respondents 65% (111) agreed that training was important since lack of training affected First Responders response to U.S Embassy. Majority of respondents argued that in 1998, terrorism issues was now being captured in Kenyan imaginations thus First Responders were not well aware of it. 4% (7) of the respondents indicated that they were not sure whether the attack was due to deficiency with First Responders training. Findings were supported by Dunstan & Simon (2011), that the rescue efforts were conducted by Israel Rescue team due to their specialized equipment and saved a mother and a son trapped on the 22nd floor of the Co-operative House for more than 36 hours. The response level can measure the preparedness level between Kenya First Responders and those from other countries.

The respondents to terror attack on Mfangano Lane, Mwauras Pub indicated that training is only the first step in making all situational awareness at all time and at all incidents. This was represented by 28 (16%) of the respondents who asserted that training was very important and that lack of training is the cause of deficiencies in response to the occurring terror attacks. 113 (66%) of the respondents agreed that training was important, and that Mfangano lane terror attack could be detected before the attack by Intelligence Service if were all well trained in intelligence (Respondent from field, 2019). 7 (4%) of the respondents agreed that it was less important. 3 (2%) of the respondents said that training had no association with response to Mfangano lane terror attack while 17 (10%) were not sure if training had any relationship with the response to Mwauras Mfangano lane terror attack.

On OTC bus station terror attack, 26 (15%) of the respondents agreed that there is relationship between training of First Responders and response to OTC bus station terror attack, they strongly agreed that it was very important and due to deficiency in training led to occurrence of the attack. 117 (69%) of respondents admitted that deficiencies with First Responders training had a great impact in response OTC bus station attack, that lack of training affects preparedness to response to terror attacks and that is why we had the attack. 3 (2%) of the respondents indicated that training in relation to OTC bus attack response was of less important, while 7 (4%) of the respondents indicated that there was no association. 17 (10%) of the respondents were not sure if there is relationship between deficiencies with First Responders training and response to OTC bus station terror attack.

The respondents to terror attack on First Avenue Eastleigh indicated there was deficiencies in training in relation to response to the attack. This was represented by 29 (17%) of the respondents who asserted that training was very important and that lack of training is the cause of deficiencies in response to the First Avenue Eastleigh. 119 (70%) of the respondents agreed that training was important, and that First Avenue Eastleigh terror attack could be detected before the attack by Intelligence Service if were well trained in intelligence. 8 (5%) of the respondents agreed that it was less important. 3 (2%) of the respondents said that training had no association with response First Avenue Eastleigh terror attack while 11 (6%) were not sure if training had any relationship with the response to First Avenue Eastleigh terror attack.

On Machakos bus station terror attack, 47 (27%) of the respondents agreed that there is relationship between training of First Responders and response to Machakos bus station terror attack, they strongly agreed that it was very important and due to deficiency in training led to occurrence of the attack. 103 (61%) of respondents admitted that deficiencies with First Responders training had a great impact in response Machakos bus station attack, lack of training affects preparedness to response to terror attacks and that is why we had the attack. 5 (3%) of the respondents indicated that training in relation to Machakos bus attack response was of less important, while 2 (1%) of the respondents indicated that there was no association. 19 (11%) of the respondents were not sure if there is relationship between deficiencies with First Responders training and response to Machakos bus station terror attack.

Out of the total number of respondents, 29 (17%) indicated that training was very important in response to Gikomba market terror attack. That lack of training affects preparedness to response to terror attacks, and that is why we had the attack. This was supported by 114 (67%) of the respondents indicating that training was important in response to Gikomba market terror attack. 7 (4%) of the respondents to terror attack on Gikomba market terror attack indicated that training was less important and that there was deficiencies in training in relation to response to the attack. 3 (2%) of the respondents argued that training deficiency was not experienced in response to Gikomba market attack by First Responders. This was indicated under no association response. 19 (11%) of the respondents were not sure if training had any relationship with the response to Gikomba market terror attack.

On Dusit D2 complex terror attack response, 19 (11%) of the respondents indicated that training was very important. Was supported by 3 (2%) of the respondents indicating that training was important in response to Dusit D2 complex terror attack and that training deficiency was experienced in response to the attack. 4 (2%) of the respondents indicated that training was less important and that there was no deficiencies in training in relation to response to the attack. Response that training was less important in response to terror attack contradicts Ketcham & McGeorge (2012), who alludes that training include tests of the proposed response operations.

That emergency drills and exercises provide a setting in which operational procedures can be tested. They also facilitate inter-organizational contact, thus allowing individual members to better understand each other's professional capabilities and personal characteristics and this contributes to effective response to emergencies (Ketcham & McGeorge, 2012). That, apart from security agencies failing to heed warnings of an impending attack in the weeks before the Dusit D2 complex was hit, First Responders launched a reactionary response in which through their coordination controlled the situation (Musambi & Everlyne, 2019). 140 (82%) of the respondents argued that training deficiency had no association in response to Dusit 2 complex attack, the fact that response was well coordinated by First Responders shows the effectiveness of training in response to terror attacks. 4 (2%) of the respondents were not sure if training had any relationship with the response to Dusit 2 complex terror attack.

Effect of level and type of training on preparedness of First Responders during terrorist attacks

Figure 1: shows the effect of level and type of training on preparedness of First Responders during terrorist attacks.

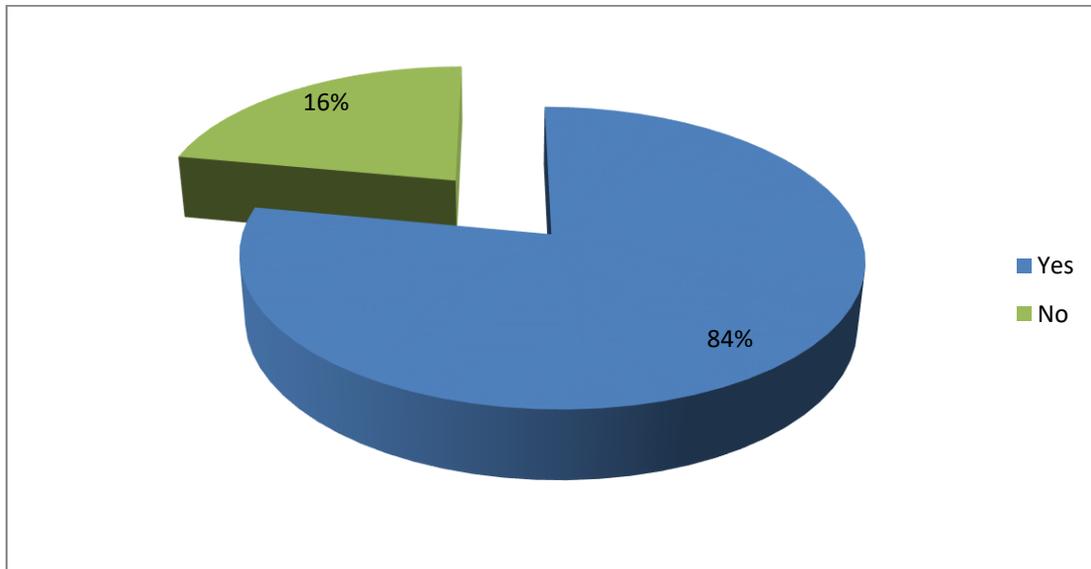


Figure 1: Effect of level and type of training on preparedness of First Responders during terrorist attacks

Source: Author (2019)

Based on findings, 143 (84%) of the total respondents indicated that level and type of training had an effect on the preparedness of First Responders during terrorist attacks. While 27 (16%) of the total respondents stated that level and type training had no effect on the preparedness of First Responders during terrorist attacks.

Jacoby (2004), noted that training is an integral part of human resource development programme in almost all organizations. Is the cornerstone of effective management because it makes employees more efficient and productive. Untrained personnel are bound to commit errors while handling equipment resulting in incidents and improper response during terror attacks. Proper training and development programs ensure safety in handling the organization's resources which results in reduction in the accident rates thus ensuring accomplishment of the target missions.

The need for safety managers to gather information on responders' capabilities and training is created by the significant differences that exist among responding organizations. If safety managers could assume a common, base level of training for all responders involved at an incident, the need to gather such information would be significantly reduced. In addition to contributing directly to better safety management, not having to devote effort to gathering information on responder capabilities would allow safety managers to give more attention to other concerns (Lawrence & Lorsch, 2001).

Study on developing minimum standards for safety and health training for all Responders involved in disaster response operations especially terrorism indicated that the training curriculum should include a basic familiarity with the following: the Incident Command System approach to disaster response, common terminology for safety and health issues, an "all-hazards" perspective on the range of hazards that could be encountered during disaster response activities, relevant protective equipment, and when and how to use it, decontamination and rehabilitation processes and an overview of the diverse organizations that are likely to become involved in major disaster response. This is further supported by Curtis (2008) on counterterrorism training for transit agencies that effective integrated command systems training is function-specific training reinforcing awareness of the responsibilities and

communication protocols to be used during response to an emergency thereby improving coordination and response from external agencies.

According to Riedel (2008), Personal Protective Equipment Training as specific training should be standardized across responder organizations as much as possible to ensure that everyone has a common knowledge base. In the case of private firms, this could involve formal recertification similar to fulfilling the requirements for working on other hazardous-materials sites. That there is need for pre-disaster extensive training particularly among response organizations. There is need of embracing inclusiveness in pre-disaster training and exercises since every type of responder is on the “front lines” and facing similar threats.

The ability to sustain a long response to a large-scale incident depends on the logistical capabilities that can be put in place. Including the people and organizations responsible for developing and operating logistics systems in the planning discussions can provide them with a better understanding of the needs of responders. Conversely, incident commanders can gain more accurate knowledge and expectations of which logistics capabilities are and, importantly, are not likely to be available (Kim & Yukl, 2001).

During the data collection, participants consistently made it clear that management practices at incident sites are intimately tied to protecting the health and safety of emergency responders. That their fatalities and death to their bosses was just a number which could be replaced during recruitment thus not embracing on the life and safety of their personnel. Respondents claimed that there is need for quick and effective establishment of an effective command authority over an incident site. Until such authority is established, it is difficult to address any of the other concerns about responder protection. They made clear that the plans made for establishing command over a disaster site must be sufficiently resilient and robust to handle situations that can disrupt them and also backup supervisors should be trained to take over in case of the loss of senior personnel. The West Gate mall attack response was particularly hampered by the loss of much of the key leadership and the confusion of the city’s disaster coordination centers leading to infighting between responders (Aronson & Samuel, 2013).

Curtis (2008) article on “After Mumbai: Time to Strengthen U.S. and India Counterterrorism Cooperation,” acknowledges that training should reinforce a command, control, and intelligence architecture that sustains crisis decision making and field management efforts.

Research findings corroborates Curtis (2008) that individuals trained and experienced can play the coordinating and “bridging” role among different agencies and organizations with safety responsibilities and capabilities in incident management. That playing this role successfully requires knowledge and expertise that most members of the response community are unlikely to get in the standard training available to them and their day to day operations; this suggests the need to develop specialized training and preparation efforts.

Influence of different types of training on preparedness of First Responders during terrorist attacks

During the process of data collection under training, Researcher sought to verify on the following courses if they had any influence in preparedness of First Responders during terrorists attack; refresher courses and team building, basic first aid courses, fire emergency training, medical training course, search, rescue and surveillance, incident command course and disaster management course. Figure 2 shows their response.

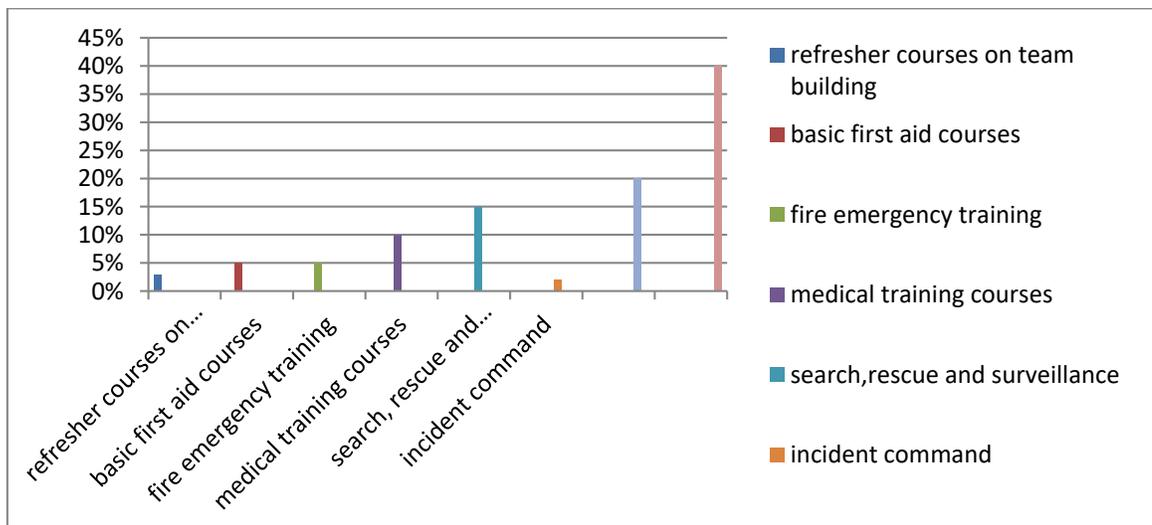


Figure 2: Influence of different types of training in preparedness of First Responders during terrorists attack

Source: Field Data Analysis (2019)

Basing on the analysis, 3 (2%) of the total respondents ranked incident command as the least in relation to influence of different types of training in preparedness of First Responders during terror attacks. Followed by refresher courses on team building with 5 (3%). 9 (5%) ranked basic first aid courses and fire emergency training matching the same number of respondents as third least types of training. Medical training courses was ranked as the fourth type of training, represented by 17 (10%) of the respondents. 26 (15%) of the respondents claimed that search, rescue and surveillance was the third important aspect in regard to influence of different types of training in preparedness of First Responders during terror attacks. Disaster management course was ranked second by 34 (20%) respondents. Majority of the respondents indicated that security and intelligence courses are most important in regard to preparedness of First Responders during terror attacks with the response rate of 72 (45%). From this findings, conclusion can be drawn that security and intelligence courses is of great importance and thus affects the preparedness of First Responders and its influence to efficacious response to terror attacks. Intelligence is a key factor in countering terrorism as it can provide the means to anticipate, pre-empt and respond to this threats (Mehta, 2013).

Training personnel adequately is necessary to ensure that the organization will function satisfactorily. Research findings contradict Buchanan & Freeman (2000) on results obtained from the respondents. Respondents claimed that incident command system training was the least training to be undertaken in response to preparedness in effective response to terrorists attack. According to Buchanan & Freeman (2000), incident command system training is an important aspect of attaining effective response to disasters. That area command should include representatives from all affected agencies, such as law enforcement, public health, fire, emergency medical services, public works, and mass transit and transportation. As the response grows and becomes more complex, one of the area commands should evolve into a unified command. A unified command helps to determine each jurisdiction's complex needs, including the need for health care, mass evacuation, and medical equipment.

Buchanan & Freeman (2000) argument became logic basing on the influence of these training on preparedness of response organizations to terrorists attack. That incident command structure addresses organizational components preparedness in counter disaster scenarios:

Direction / Control / Coordination Structure - an operational chain or basic network through which authority can be delegated and decisions implemented.

Facilities - for operations rooms, communications centers, equipment stores and personnel facilities.

Communications - the direction, control and coordination structure ensuring effective communications network (for instance, a police network) and supporting this with other networks for backup or standby emergency purposes. Existing regular broadcasting systems are, of course, invaluable for disseminating information to the public and for transmitting messages in circumstance where this is necessary.

According to Drabek (1986), the command and control framework using the Incident Command System and the National Incident Management System is sufficiently flexible to apply to the enormous challenges of an improvised nuclear device attack. The establishment of command and control starts with developing specific plans and policies ahead of time, ensuring clarity in roles and responsibilities, and planning for complex commands throughout the affected region. Command and control systems are uniquely compromised in terrorists attack incidents relative to other disasters because of the massive disruption of communications, transportation, and financial systems, the scarcity of resources, the inability to deploy first responders into the severe damage zone, and ethical dilemmas for triaging patients (Drabek, 1986).

The flexibility of an ICS enables it to be adapted to all types of emergencies including fire, Rescue and law enforcement. It can be expanded or compressed depending on the complexity of the incident. Its purpose is to prevent independent actions and chaos at the scene of the incident. If an ICS is not established immediately, other rescuers may take independent actions, which will often be in conflict. "Without organization and accountability, chaos will occur and too many people will attempt to command the incident. If you do not control the situation, the situation will control you (Bowers, 1960).

Summary

On rating deficiency of First Responders training in relation to response to terror attacks in Nairobi County, it was noted that inadequate training led to ineffective response to terror attacks. On effect of level and type of training on preparedness of First Responders during terrorist attacks, the findings indicated that level and type of training had effect on the preparedness of First

Responders during terrorist attacks. Some of managers who formed part of (FGD) attest that training was the cornerstone of effective management because it makes employees more efficient and productive.

Lastly, on influence of different types of training on preparedness of First Responders, majority of the respondents 72 (45%) indicated that security and intelligence courses were the most important type of courses to be undertaken by First Responders so as to prepare and plan before the attacks.

Conclusion

There is no standard and coordinated training between First Responders organizations since they are trained to perform different roles. From the findings we can conclude that security and intelligence courses are the most important type of courses to be undertaken by First Responders to effectively respond to terrorism issues since it contributes to preemptive response and this helps in thwarting terrorist activities.

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Corporate Governance And Voluntary Disclosure Level; Evidence From Manufacturing Companies In Sri Lanka

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Abstract: This study investigate the relationship between Relationship between Corporate Governance Attributes and Voluntary Disclosure Level of Sri Lankan manufacturing companies listed in Colombo Stock Exchange (CSE). The corporate governance attributes include ownership Concentration (OC), Board Independence (BI), CEO Duality (CD) and Number of Female Directors (FD). In here research use relative disclosure index for measuring voluntary disclosure level. Further researcher chose the 31 companies as sample of the study. The data collection methodology of the study is content analysis of annual reports of the manufacturing firms listed CSE for the period of 2015-2018. In order to analyse the outcomes, researcher occupied STATA Data Analysis Software. The results indicate that ownership concentration is negatively associated with the voluntary disclosure level. Board independence, CEO Duality and were found to have insignificant to determine the voluntary disclosure level. But female directors in the board have positive significant relationship with voluntary disclosure level.

This study provide empirical background for Sri Lankan regulatory bodies and policy makers to enhance the corporate governance mechanism and voluntary disclosure level of the listed firms. The findings also contribute to understand the weak disclosure practices of the manufacturing firms.

Key Words: Corporate Governance, Voluntary Disclosures, Manufacturing Companies, Annual Reports

Introduction

In last decade after the economic crisis prevailed in the global economy, active parties in the business world such as investors, academics, regulators and public paid more attention on corporate disclosure. Then they are expecting more information rather than earlier. Therefore internal bodies in the business give more concern on information disclosure level of a businesses than before with the motive of satisfy their interested parties. Business organizations have become aware of the importance of presenting information about the broader range of activities including both their financial performance and non-financial performance such as socially responsible performance. Disclosure is a term for making information accessible to interested and affected parties. According to the Fathi, 2013 Disclosure is considered a good way to communicate with stakeholders on the progress of a company because it provides evidence on the nature of management and provides an idea of the strengths of the company.

Nowadays corporate governance becomes one of the hottest topic among the worldwide businesses. Because businesspersons realized, that corporate governance can make great impact on their business performance as well as long-term healthy survival of the company. In addition, scholars further proved well-established corporate governance reduce the agency cost and as well reduce information asymmetry between shareholders and managers. To attract investors to participate in financial markets and to follow codes of good governance, financial authorities request and encourage companies to disclose voluntary information (Fathi, 2013).

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As per the above details, objective of this study is to examine the relationship between corporate governance and voluntary disclosure of companies which are registered in CSE, Sri Lanka. The paper is structured in the following way: Section 2 presents the selected literature on the corporate governance, voluntary disclosure level as well as agency theory. Section 3 presents methodology Section 4 covers empirical results and discussion. The conclusion presented in the last section.

Literature Review

The main basis for make studies on voluntary disclosure level is agency theory. In Jensen & Meckling, 1976 define agency relationship is an agreement between one or more persons to perform a task on behalf of one side which provide decision making authority to the service providing party. This theory indirectly implies though there is a relationship between two parties, both parties attempt to maximize their own objectives rather than agency objectives. Under such circumstance agency problem, emerge between two parties. Presence of agency problem in corporate firms define interest conflict among the ownership and stewardship. In Chen & Jaggi, 2001 said agency relationship cause to make agency cost due to managerial behaviour to satisfy their own interest. Therefore proper information disclosure from an annual report can overcome the confrontation among the insiders and outsiders. In addition Charumathi & Ramesh, 2015 said 'The disclosure by the companies also tends to reduce the information asymmetry between external stakeholders and management'.

'Corporate governance mechanisms are introduced to control the agency problem and ensure that managers act in the shareholders' interest. (Ho & Shun Wong, A study of the relationship between corporate governance structures and the extent of voluntary disclosure, 2001). The Board of directors bear the main responsibility of corporate governance. Moreover, the shareholders duty to appoint appropriate board of directors who can collaborate the corporate governance within the business. 'Corporate governance, which promotes corporate transparency and accountability, is predicted to be significantly associated with voluntary disclosure' (Jianguo, 2007). The link between these two parties provide good governance output to the stakeholders such as managers, customers, public & government. Weak corporate governance leading to expropriation of minority shareholders, and low information disclosure levels causing a high information gap between managers and investors (Uyar, Kilic, & Bayyurt, 2013)

Ownership Concentration

According to the Jensen & Meckling, 1976 agency costs generated by the corporate form leads to a theory of the ownership structure of the firm. Further, it said when the firm's share ownership more proliferate; there can be high chance of emerging agency problem. Since firms supposed to disclose more information to reduce agency cost. On the other hand, a well concentrated ownership structure able to control over the minority shareholders at the firm (Yuen, 2009)

Further, there are several studies provide different judgments for relationship between ownership concentration and voluntary disclosure level under their scope. Out of number of studies, followings are taken prominent place. Such study of Lim, Matolcsy, & Chow, 2007 proved increases in institutional ownership cause to increases in voluntary disclosure level of a firm. Further, research studies done by Haniffa & Cooke, 2002 and Chau & Gray, 2002 provide evidence to relationship between the ownership concentration and voluntary disclosure level. Also Nakhodchari & Garkaz, 2014 said voluntary disclosure has a positive impact on the corporate performance and it influences to the protection of both shareholders' and interested parties' interest. However, when researchers concern about the previous studies, there are mixed results on this relationship. The studies conducted by Oliveira, Lima, & Craig, 2006, Makhija & Patton, 2004 proved ownership concentration is a significant determinant to decide the voluntary disclosure level. Further Bushee & Noe, 2017 and Healy, 1999 revealed there is a positive relationship between ownership concentration and voluntary disclosure level. Furthermore Uyar, Kilic, & Bayyurt, 2013) and Saha & Akter, 2013

found negative significant in this relationship. In addition Yuen, 2009 found there is no relationship between ownership concentration and voluntary disclosure level.

However based on the agency theory and reviewed literature, developed hypothesis as follows:

H1: There is a positive relationship between ownership concentration and voluntary disclosure level.

Board Independence

Board directors are the first bullet which shareholders can use to exert their influence on behaviours of management in order to ensure that company is run on their interest. The company's board consist with high percentage of independent non-executive directors, they are willing to disclose information voluntarily in a higher level (Hashim, Nawawi, & Salin, Determinants of Strategic Information Disclosure - Malaysian Evidence, 2014). Further, more percentage of independent non-executive directors enriched the higher financial disclosure quality and reduce the benefit taken by restraining of information (Forker, 1992) 'Independent directors may not exert sufficient monitoring power if their numbers only account for a small proportion of board membership.

There are mix result for the relationship between board independence and voluntary disclosure level from the previous studies. The study done by Abeywardana & Panditharathna, 2016 supported for the negative relationship among board independence and voluntary disclosure level. Fathi, 2013 and Hashim, Nawawi, & Salin, 2014 said that there is no significance relationship between voluntary disclosure level and board independence. Forker, 1992 ; Haniffa & Cooke, 2002 ; Uyar, Kilic, & Bayyurt, 2013 and Chen & Jaggi, 2001 revealed there is a positive relationship between proportion of independence directors in a board and voluntary disclosure level. Furthermore Mohammadzadeh, Assistant, & Khosbakht, 2011 proved positive, strong and significant relationship between independence directors and voluntary disclosure level. Apart from all that Jianguo, 2007 ; Boujelbene & Affes, 2013 and Yuen, 2009 demonstrate increase of independent directors in board increases the corporate disclosure. Independent board contribute to more voluntary disclosure on forward looking information and strategic information (Lim, Matolcsy, & Chow, 2007). At last with reference to empirical studies develop hypothesis as follows :

H2: There is a positive relationship between independent directors on the board and the level of voluntary disclosure level.

CEO Duality

"CEO duality refers to the circumstances whereby the chairman of a corporate board is also the company's CEO or managing director. "The controlling power of the board means that the CEO is the key person and he/she may also be the chairman/vic chairman of the Board of the directors" (Yuen, 2009). According to the agency theory combination of functions may negatively affected to the healthy control of board. Therefore CEO duality directly impact to the decision making power which cause to limited the board independence. CEO who do not pay dual role in the firm assist to improve the board independence (Yuen, 2009).

In line with empirical study done by (Yuen, 2009) indicate there is no association between CEO duality and high level of voluntary disclosure level. Further Al-Shammari & Al-Sultan, 2010 says corporate information disclosure predicted to be low because of CEO duality supposed to hide some information from shareholders for the fulfilment of their personal aspiration. Similarly Hashim, Nawawi, & Salin, 2014 demonstrate CEO duality not significantly related with the voluntary disclosure level of a firm. Further Jianguo, 2007 found CEO duality is associated with lower disclosure. Likewise there are several studies signalled CEO duality is associated with lower level of voluntary disclosure level. Studies Forker, 1992), ; Ho & Shun Wong, 2001 ; Hashim, Nawawi, & Salin, 2014 ; Haniffa & Cooke, 2002; Ramli, Surbaini, & Ramli, 2013. But in contrast Fathi, 2013

express combined function of Chairman and Chief Executive Officer adversely affects the level of financial disclosure. Finally considering all these arguments researcher build up the following hypothesis as

H3: There is a negative relationship between CEO duality and voluntary disclosure level.

Number of Female Directors

“Gender diversity of director’s play an important role during both the communication and decision making process as to which information to disclose in the in the reports by the firm directors” (Nalikka, 2009). Empirical studies regards to this attribute reveals that gender diversity and the voluntary disclosure level indirectly interrelated. That means gender diversity affected to enhance the firm value and better performances which increases the voluntary disclosure level.

There are handful studies investigate the relationship between number of female directors and voluntary disclosure level in annual reports. Therefore conduct a study on this relationship is a crucial aspects when dealing with disclosure management. Out of empirical studies, (Ben-Amar, Chang, & McIlkenny, 2017) indicate number of female directors in the board positively significant to determine voluntary disclosure level. Ramli, Surbaini, & Ramli, 2013; Nalikka, 2009 found there is no any significant relationship between proportion of female directors in the board and voluntary disclosure level .Based on previous studies researcher develop the hypothesis as follows:

H4: There is a positive relationship between the number of female directors in the board and voluntary disclosure level.

Methodology

34 manufacturing firms listed in the Colombo Stock Exchange are selected as, the sample where the population consists of 315 listed companies. This sample selected based on the manufacturing industry that firms belong. The study used secondary data, which collected from annual reports published on 2015 to 2018 of respective companies. These data analysed using the statistical package STATA.

This study took the voluntary disclosure level as a dependent variable, which is a categorical variable. Accordingly comply with previous studies they decided to use voluntary disclosure indices to further develop the strategy. Some researchers used checklist made by themselves or else checklist developed by others. This study created an index which based on previous studies conducted by Abeywardana & Panditharathna, 2016; Al-Shammari & Al-Sultan, 2010; Charumathi & Ramesh, 2015; Fathi, 2013, Lim, Matolcsy, & Chow, 2007. By using index researchers conducted detailed review on information of annual reports of listed firms, which are published in Colombo, stock exchange. This index is consisted with 35 items and for the convenience to manage it has been grouped in to seven categories. Such categories include General information of selected firms’, their contribution to stakeholders, employees and intellectual capital details and finally future forecasting information of them. Researcher detect presence of disclosure items, researcher applied ‘1’ if the item present and ‘0’ if the item is absent in the annual reports. After that, get the summation of score of each item and calculate total number of items disclose under all category of each company as per each year.

Operationalization

No	Indicator	Variable	Operational definition
Voluntary Disclosure Level			
1.	VD	Voluntary Disclosure Level	Voluntary Disclosure Index
Corporate Governance variables			
2	OC	.Ownership Concentration	Proportion of total shares on issue that were held by the 20 largest shareholders
3	BI	Board Independence	Number of non-executive independence directors in the board
4	CD	CEO Duality	Dummy variable coded “1” if the CEO is also the chairman of the board and “0” if the two positions are occupied by different individuals.
5	FD	Number of female directors	Number of female directors on the board

Table 1

In order to test the relationship between dependent variable, independent variable and further test the hypothesis of this study from multiple regression analysis the following model is used.

$$VD_{it} = \alpha_{it} + \beta OC_{it} + \beta BI_{it} + \beta CD_{it} + \beta FD_{it}$$

VD_{it} = Voluntary Disclosure Level for the i firm and t time

βOC_{it} = Ownership Concentration

βBI_{it} = Board Independence

βCD_{it} = CEO Duality

βFD_{it} = Female Directors

According to the data type or types, the type of software require to apply can be varied. Therefore, STATA data analysing software used for this study.

Data Analysis

Descriptive statistics

Following table 2 shows the descriptive statistics of variables

Variable	Mean	S.D	Min	Max
Vvoluntary disclosure level	22.08	8.04	7	35

ownership concentration	0.83	0.11	0.3	.99
Board Independence	3.01	1.72	0	13
Prop. Female Directors	0.66	0.93	0	6

Table 2

As the first point, it shows the distribution of voluntary disclosure level (VD). The mean value of 22.08 indicates Sri Lankan manufacturing companies disclose averagely twenty two items out of Thirty Five items of voluntary disclosure index. Further its range between seven minimum and thirty-five maximum, which implies there is a large variation in the voluntary disclosure practices depicted in annual reports of listed manufacturing firms. Next step of this table is to describe the independent variables numerically. Proportion of shares held by top twenty shareholders taken as the measurement indicator of ownership concentration. Mean of the shares held by top twenty is 0.83 that demonstrates large proportion of shares held by top twenty shareholders in average number of firm in the sample. However, it ranges between 0.30 and 0.99, which depicts highly concentrated ownership. Board Independence measured as number of independence non-executive directors in the board. This variable range from zero to thirteen, where, it is only one company has no independence director in one year. The mean value of board independence is 3.02, which says average companies have approximately three board members as independence non-executive directors. The minimum three independence directors on board provide better contribution to enhance the accountability and transparency of information disclose in the annual reports. The mean of number of female directors is 0.67, which figured average companies of sample represent one female director on their board. However board might be, represent maximum six female members or else no any female member. CEO duality considered as dummy variable, which measured using scale of '0' and '1'. Therefore, it is excluded when calculating descriptive statistics. Due to the misleading of descriptive statistics analysis of this sample.

Multivariate Analysis

Multicollinearity means correlation between two or more variables. When its prevail in a relationship it is very difficult predict the individual effect of each independent variable. Hence, absence of collinearity is good for a regression model. In here, researchers used the two tools test multicollinearity such are Variance Inflation Factor (VIF) and Tolerance level.

Below table shows the Variance Inflation Factor results of the each independent variables whereas maximum VIF value is equal to the 1.42. If any VIF value is less than 10 multicollinearity is not a significant case in a regression. Thus, researchers can determine there is no collinearity between any of independent variable in this study. Furthermore, if tolerance level, which denote as 1/VIF is greater than "0.1" also predict there is no significant effect collinearity. Accordingly this study further proved there is no significant collinearity between independent variables by showing tolerance level greater than 0.1.

Variable	VIF	1/VIF
OC	1.42	0.70288
BI	1.34	0.746472
FD	1.32	0.757868
CD	1.00	0.996356
Mean VIF	1.27	
Max VIF	1.42	

Table 3

The correlation coefficient in between dependent variable and independent variables are presented in below table. This measures indicate how extent two variables fluctuate together. Positive correlation revealed when one variable increases, how extent other variable going to be increased and the negative correlation revealed when one variable increases how extent other variable going to be decreased. The results of the table 4 shows Ownership concentration (OC) has a positive correlation with Voluntary Disclosure level (VD) and negative correlation with both Board Independence (BI) and Number of female directors. Further, there is a positive correlation between Board Independence and Female Directors also. Accordingly the prior literature there is no impact of collinearity if the correlation is not exceed the 0.80. Therefore in this study shows maximum correlation as 0.4471 which indicates there is no significant collinearity in these variables.

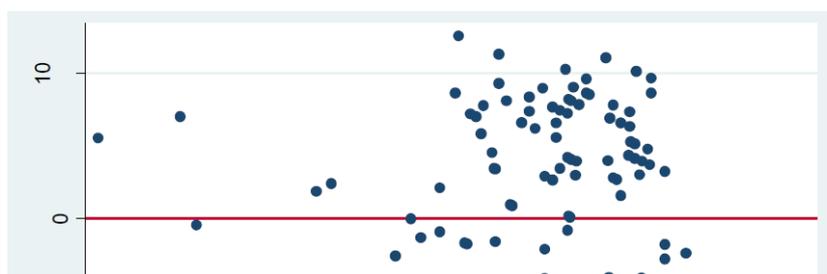
	VD	OC	BI	CD	FD
VD	1				
OC	0.3002*	1			
BI	-0.0686	-0.4601*	1		
CD	-0.1338	0.0504	-0.0216	1	
FD	-0.1543	-0.3864*	0.4471*	-0.0478	1

Table 4

Heteroscedasticity

According to the (Saunders, Lewis, & Thornhill, 2009) homoscedasticity means ‘The extent to which the data values for the dependent and independent variables have equal variances’. This not a condition for data analysis. If the variables are consisted with unequal variances, which called as heteroscedasticity, that will good to carry out the analysis further. There are number of tests introduced by analysis software to identify extent of variances in variables. For this study, researchers applied both statistical test and graphical method to identify the variances. Table 5 shows results of Breusch-Pagan/Cook-Weisberg test, which indicate probability of chi 2 =0.5956 where it is greater than significant level of 5%. Hence, variables of this study-employed heteroscedasticity. Additionally, researchers depict graphical representation in Graph 1 which shows variables are scattered in everywhere and not cluster to the best-fitted line. Therefore, it has further proved there are no equal variances in variables.

Table 5



Breusch-Pagan / Cook-Weisberg test for heteroscedasticity

Ho: Constant variance

Variables: fitted values of vd

chi2(1) = 0.28

Prob > chi2 = 0.5956

Graph 1

Regression Analysis

The below table 6 further shows outcomes of multiple regression analysis which relevant to the dependent variable and independent variables. In here researcher paid more attention to the coefficient values and P values of T-test. In this table reveals voluntary disclosure level of a firm change independently in 1.88 value without any impact of corporate governance attributes.

Number of Observations = 124						
F(4,119) = 4.22						
Prob>F = 0.0031						
R squared = 0.1243						
Adjusted R-squared = 0.0949						
VD	Coef.	Std. Err.	T	P>t	[95% Conf.Interval]	
OC	23.29894	7.042662	3.31	0.001	9.353767	37.24411
BI	0.552072	0.477171	1.16	0.25	-0.3927737	1.496918
CD	-4.95556	2.802628	-1.77	0.08	-10.50504	0.593929
FD	-0.75388	0.848104	-0.89	0.376	-2.433212	0.925449
_cons	1.882941	6.624905	0.28	0.777	-11.23503	15.00091

Table 6

Hausman Test

This research conducted Durbin-Wu-Hausman test to identify which model is suited for analysis. There are two types of model such as fixed effect model and random effect model. Under this test if significant, value less than the 5% researcher need to select the fixed effect model, if not random effect model. In this study Durbin-Wu-Hausman test indicate 0.0000 value. Hence, researcher selected the fixed effect model to analyse the relationship between corporate governance attributes and voluntary disclosure level.

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(4) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 60.08$$

$$\text{Prob>chi2} = 0.0000$$

Regression with fixed effect

Then run the regression by considering fixed effect model. Table 7 shows the results of this model.

F(4,89) = 2.49						
Prob>F = 0.0488						
R squared = 0.1006						
VD	Coef.	Std. Err.	T	P>t	[95% Conf.Interval]	
OC	-12.7933	6.336667	-2.02	0.047	-25.3841	-0.20247
BI	0.137546	0.306595	0.45	0.655	-0.47165	0.746744
CD	0.497597	1.65727	0.3	0.765	-2.79536	3.790556
FD	1.30292	0.741334	1.76	0.082	-0.1701	2.775935
_cons	31.39032	5.146279	6.1	0	21.16477	41.61586

Table 7

In here, F-statics value of these analysis shows 0.0488 that indicate this model is significant. According to this method the value of t-statistics provide the decision about including a new independent variable or not. Result depicts $R^2 = 0.1060$, which implies independent variables of the study, explain 10.6% of dependent variable. Thus, explanatory power of the independent variables are not much powerful.

Furthermore, multiple regression occupied to determine the coefficients or slope of independent variables in the following regression equation.

$$VD_{it} = 1.88_{it} + -12.79C_{it} + 0.13BI_{it} + -0.49CD_{it} + 1.3FD_{it} + \epsilon_{it}$$

The ownership concentration is most important variable in this study. There is high coefficient of -12.79 Ownership Concentration (OC), which is statistically significant at the 0.05 level. But the relationship is negative. The results suggests that proportion of shares owned by top twenty shareholders is negatively associated with the voluntary disclosure level. Therefore, H1 is rejected.

Board Independence (BI) is one of most important explanatory variable in the regression model for which the coefficient is positive 0.13, but statistically insignificant. The results intimate that number of independent non-executive directors on board does not affect to the level of voluntary disclosure. Therefore H2 hypothesis is not supported.

The regression results for the CEO duality depicts negative coefficient of 0.49 and this relationship is statistically insignificant. This result is rejected H3.

The coefficient of number of Female Directors on Board (FD) is 1.30 and it is statistically significant. Female directors on board is significantly affect to the level of voluntary disclosure. Therefore H4 hypothesis is accepted.

Conclusion

This study is a continuation of early studies where a set of corporate governance attributes were reviewed to investigate their relationship with the voluntary disclosure level of manufacturing companies. The purpose of this study to examine whether there

is relationship between selected corporate governance attributes and voluntary disclosure level and further detect the what kind of relationship do they have either it is positive or negative. These attributes consist with the Ownership Concentration, Board Independence, CEO Duality and Number of Female Directors. Moreover, previous studies have explored influence of audit committee, Family participation on board, ownership structure, percentage held by institutional shareholders, Number of directors on board, qualifications of board members and number audit meeting to determine voluntary disclosure level. However, researchers of this study give their priority for Ownership Concentration, Board Independence, CEO Duality and Number of Female Directors when they were selected the variables due to the frequency of tested is very high. Therefore, it is convenience for researchers to understand and inspect the relationship between these variables. This study has been used voluntary disclosure index to calculate voluntary disclosure level of 31 listed manufacturing companies in Sri Lanka over the period of 2015-2018.

In particular, this study focused to determine how these factors significantly related to the voluntary disclosure level of manufacturing firms in Sri Lanka. Because under the Sri Lankan context there were handful of studies based on voluntary disclosure level of firm. Further, this research is proceed to add new knowledge not only for the Sri Lankan context but also for the regional context due to the lack of studies on developing countries.

In Sri Lankan context, most of the businesses do not have sufficient knowledge about corporate governance and impact to the business performance as well as disclosure level. Because until 2009 there were no healthy environment for Sri Lankan businesses due to 30 years of Civil war. Therefore, they did not focus on any of other requirement rather than survival of business. After the war era businesses unable to reach to their business goals and objectives due to the weakness in their corporate governance practices and lack of knowledge on capital markets. Researchers identified the requirement of new knowledge to overcome the issues and barriers for enrichment of the business performance. Hence, this study provide guidance for businesses to overcome the prevailing issue and establish a proper policies and structures within the business. Further, purpose of this research work to provide suggestions and opinions for investors, policy makers and regulatory bodies to build up a strong corporate governance structure and stimulate businesses to increase their voluntary disclosure level of annual reports.

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An assessment of factors contributed to the EFL learners' negative attitude towards their English language oral errors

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Abstract

As my previous study indicates, majority of the EFL learners are reluctant to speak English in spoken class than practicing the target language through trial-and-error. They have negative attitude towards their oral errors. Thus, the purpose of this study was to assess factors contributed to the EFL learners' negative attitudes to their English language oral errors, and to identify the effects of the attitudes on the EFL learners speaking skills. To do so, 100 systematically sampled preparatory school students and 5 their English language teachers from three Preparatory Schools were selected. The study has come up with the following findings. Majority of the learners identified that they fear of their classmates' ridicule and negative evaluation. A large number of them are concerned with accuracy than fluency in speaking English. Furthermore, their English teachers' frequent corrections of their oral errors have negatively influenced them. Similarly, they think that their teachers' expectation of perfect accuracy on them during English language oral practice is the other one. To sum up, the points

stated above are some of the factors that negatively influenced the learners on the English language oral production.

Key Words: EFL, English language, learners' attitude, oral error

I. Introduction

Attitudes, like other cognition and affect in human beings, develop early in childhood. They are the result of different interdependent factors. As to Brown (1994) and Erlenawati (2002), learners' attitudes are derived from variety of sources such as the learners' socio cultural background, parents' and peers' attitudes, learners' previous experience in education or language learning, uncritical acceptance of popular wisdom, teaching and learning practices and the social context of language learning. These factors cause a dimension of either positive or negative attitudes.

According to Nunan and Lamb (1996) and Erlenawati (2002), learners' attitudes are derived from variety of sources like previous learning experiences, personality traits, teaching and learning practices, social context and so on. These attitudes of learners to the processes and strategies of EFL learning may foster or hamper the success of their learning. Similarly, Erlenawati (2002) claims that attitudes can "influence learners' motivation to learn, their expectations about language learning, their perceptions about what is easy or difficult about a language, and the strategies they choose in leaning". In the same way, learners have their own self perceptions of their errors in learning EFL which may influence their success in learning the language. As Littlewood, (2008)states, the logic was that when learning a second language a person will tend to use mother tongue structures in second language production, and where L1 structures differ from the L2, mistakes will be made.

Learning to speak a foreign language constitutes taking the risk of making errors and its complex unpredictable consequences. As described earlier, there appears either positive or negative views from the learners themselves to their own oral errors. These attitudes of the learners towards their own oral errors stem from array of variables like the learners' socio cultural background and personality traits, other people's attitude, classroom social reaction, the teacher's perception and treatment of the learners' oral errors, the learners view of the teachers' role and their own level of expectation of their own performance and achievement in the language proficiency (Richards, 1986; Ellis, 1994).

On the one hand, learners may hold positive attitudes towards their own oral errors as a result of the following factors. Firstly, as cited by McKeating

(1981) and Atkins and associates (1995) if learners are brought up and live in a society who view errors as something natural, unavoidable and crucial, the learners' too think of their own oral errors as something useful, tolerable and then to be improved in learning. Secondly, if the learners' have got middling anxiety and high self-esteem, and willingness to take risks, Brown (1994), claim that the learners tend to use the language at the expense of fear of making errors. Thirdly, Van Patten and Glass (1998) witness that where there is a positive feedback and tolerant reception of the learners' spoken errors by the classmates, the learners do not fear making errors in learning to speak in the foreign language. Fourthly, the positive perception to and tolerant, freer and unobtrusive treatment of learners' oral errors by the teachers enable the learners develop realistic attitudes towards their own speech deviations

In contrast, the learners' may hold erroneous attitudes towards their spoken deviations as a result of some reasons listed below. To begin with, if the society in which the learners are brought up and the people with which they interact see errors as failure which deserves punishment and elimination, the learners as well think of errors as a sign of failure to be eradicated at all as (Shim, 2007), the learner with extremely high or low anxiety, or one with low self-esteem or one who is unwilling to take risk may have negative attitude to making speech errors. As a result, the learners become reluctant to say anything in the target language and remain with little or no opportunity to learn the language through trial and error approach.

As discussed above, learners may hold either positive or negative attitudes towards their own speech errors. These learners' different attitudes of their own speech deviations in turn have either positive or negative impacts on

the learners' learning of speaking in EFL. The learners' positive attitudes towards their own oral errors create relaxed, anxiety-free condition and increased opportunities to learn speaking without fear of committing oral errors. In line with this, Littlewood (1984), Tsui (1996) and Erlenawati (2002) indicate that learners with favorable attitude to their own oral errors are more ready to engage in practicing speaking in the language taking the risk of making errors. As a result of this, the learners will enjoy to willingly learn speaking and successfully communicate orally using the foreign language English.

Similarly, learners' erroneous attitudes towards their own oral errors lead to language anxiety and use of ineffective strategies of learning speaking. First, learners, with negative attitude who are more concerned about their errors, and their performance, according to research findings referred to by Van Patten and Glass (1998), are so anxious about participating in oral production for fear of negative evaluation and criticism. Next, learners who have the attitude that errors in oral production will impede the FL learning progress refuse to engage in communicative activities, avoid speaking, hesitate to say anything and become reluctant to make the most of an opportunity to use the FL they are learning as explained by Ellis (1994) and Erlenawati (2002). In addition, learners with negative attitudes are reticent, less concerned with trying to express what he/she would like to say and have low readiness to respond in speaking in EFL classroom (Ellis, 1994).

To sum up, learners' with positive attitudes towards their own oral errors have increased opportunity to participate in oral communication so that they get increased communicative competence; whereas, learners' with negative attitudes towards their own spoken errors are unwilling to take risks of

making errors to participate in speaking in EFL classroom, hence get decreased communicative competence.

Learners' self-exposure to practice and use the English language without fear of making errors can remove inhibition. Teachers themselves must hold positive attitudes towards the learners' errors, and must be informed that errors are natural, unavoidable, crucial, and can be improved through practice (Ellis 1994). Likewise, teachers or concerned bodies have to offer consciousness-raising activities that enable the learners understand that they will make mistakes every time, mistakes are inevitable, they should not demand perfect accuracy in pronunciation, grammar and vocabulary in learning to speak the English language (Yang, 2010).

In the same way, teachers, counselors and learning specialists, as discussed by Yang (2010), after identifying the learners with erroneous attitudes, have to inform and advice students on effective language learning strategies in general and on the nature and implication of oral errors in particular. These information and advice help the learners understand that errors are unavoidable natural part of language learning, can be made by everyone every time, and can be improved through time. They also indicate the learners that errors show what they have learnt and will need to learn, and that they have to emphasize fluency over accuracy for the sake of communicating effectively though errors occur. Concerning this, studies reveal that "errors have less effect on the intelligibility of speech than many SL learners assume though intelligibility suffers as the number of errors increases" (Littlewood, 1987: 87).

Hence, the learners can understand that errors are natural, unavoidable, crucial in language learning, that some amount of language acquisition is beyond their control and that improvements can happen over time; so that they develop more favorable attitudes towards their own oral errors and be able to make use of opportunities to engage in learning and communicating in speaking English.

According to the CLT approach, making errors is a healthy part of the language learning process. When the students practice using the target language through trial- and-error, they gradually workout better ways of saying things (Spratt et al., 2010). As opposed to this, most of grade 12 students prefer silence in spoken time than practicing the target language through trial-and-error. As a result of this, there is less progress in their spoken skill throughout the year and they have poor achievement in spoken assessments. As my previous study indicates, these students perceive errors as bad habits to be avoided.

Though learners' attitudes towards their English language oral error have significant roles in the learners' success in learning foreign language, it seems that no local study related to factors of learners' negative attitudes towards their English language oral error is found in the research literature especially in the case of the study focus area. As a result, the researcher has intended to investigate factors of EFL learners' negative attitudes towards their English language oral error by focusing on Batu Terara Preparatory School, Robe Preparatory School and Dinsho preparatory School of grade 12 students.

II. Methodology

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For choosing the required sample, different principles and techniques were used. Among the 17 preparatory schools in the zone, three schools were taken purposively. Then, the number of students in each section of each school was identified. To achieve generalizable, valid and reliable data, stratified random sampling and systematic sampling techniques were used. This is to obtain representative samples as grade 12 students of these schools were grouped into 13 sections.

Thus, to determine the sample size to be taken from each section, the formula $n/N \times N_i$ was applied;

- n = total number of the sample wanted
- N = total number of target population and
- N_i = the number of each stratum or of each section.

Similarly, systematic sampling was used to determine the individual student taken from each section. To do so, first, the complete name list of each section was obtained; then, to decide the specific interval of the individuals selected from each section's name list, the formula $N/n=K$ was applied; (Wiersma, 1995:292)

- ❖ N = total population of a section
- ❖ n = the number of sample taken from a given section and
- ❖ k = a common factor used to determine the interval of the individuals to be taken from the name list.

So, every k^{th} interval in the name list of each section was selected until the number of wanted sample of the section was covered. The same was done for all the sections.

Three groups of Focus Group Discussions with six students each were also used in this study. High achievers, medium achievers and low achievers of the students were selected from the three schools purposefully. This is to get

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more information about the topic from the students through free discussion. In this study, individual semi-structured interview was used with five grade 12 English language teachers of the three schools. Among the three tools discussed above, questionnaire is the major tools of this study because it

consists of different kinds of large items. Furthermore, it was responded by a large number of respondents of the study in relation to the respondents of other tools.

III. Result and Discussion

Table 1: Factors affecting learners’ attitudes towards their English language oral errors

No	My attitudes to my English language oral errors are influenced:	Respondents										Non-response		Total	
		Agree		Strongly agree		Neutral		Disagree		Strongly disagree		No	%	No	%
		No	%	No	%	No	%	No	%	No	%				
1	Because I am afraid of taking risks of error-making	50	50	22	22	3	3	10	10	15	15	0	0	100	100
2	Because I fear of criticism (negative evaluation) on my own oral errors by other students	37	37	30	30	5	5	10	10	18	18	0	0	100	100
3	Because I fear of ridicule from my classmates when I make oral errors	45	45	20	20	9	9	13	13	13	13	0	0	100	100
4	Because I am less worried to take risks of making oral errors	10	10	12	12	12	12	30	30	36	36	0	0	100	100
5	Because of my English teacher’s criticism (negative evaluation) on my spoken errors	20	33	13	13	3	3	40	40	20	20	1	1	99	100
6	Because of my English teacher’s frequent correction of my own oral errors	52	52	22	22	6	6	10	10	9	9	1	1	99	100
7	When my classmates give positive feedback to my spoken errors	40	40	31	31	5	5	12	12	12	12	0	0	100	100
8	Because my classmates have positive attitude to my own oral errors	15	15	14	14	6	6	40	40	25	25	0	0	100	100
9	Because my English teacher has positive attitude to my own oral errors	42	42	24	24	3	3	20	20	11	11	0	0	100	100
10	Because my English teacher is sometimes tolerant of my own oral errors	19	19	10	10	8	8	49	49	14	14	0	0	100	100
11	Because my teacher expects perfect accuracy on me when I speak	46	46	30	30	2	2	13	13	9	9	0	0	100	100
12	Because my teacher informs me that perfect accuracy is impossible in learning a foreign language	19	19	16	16	4	4	31	31	28	28	2	2	98	100

13	Because I feel that perfect accuracy in speaking a foreign language is impossible at once	21	21	12	12	4	4	40	40	23	23	0	0	100	100
14	Because I always demand perfect accuracy in speaking English	47	47	24	24	2	2	16	16	11	11	0	0	100	100

As Table 1 shows, out of 100 respondents, 72% confirmed (50% agreed and 22% strongly agreed), 25% disconfirmed (10% disagreed and 15% strongly disagreed) and 3% are neutral about their attitudes are influenced in that they are afraid of taking risks of making errors (item 1). From this it can be understood that the majority of the students said that their attitudes to their own English language oral errors are affected by their afraid of taking risks of making errors. Whereas only one-fourth of them reported that their attitude is not affected by their afraid of taking risks of making errors. This implies that one of the factors negatively affecting majority of the learners' attitudes to their own English language oral errors is their being afraid of taking risks of making errors.

According to the students' responses to item 2, 28% of them disconfirmed, 67% of them confirmed and 5% of them hold neutral opinion about that their attitudes are influenced due to their fear of other students' criticism on their own English language oral errors. This tells us that for the majority of the students, negative evaluation from their classmates has affected their attitude on their spoken errors.

Similarly, response to item 3 displays that 26% of the students rejected, 65% of them confirmed and 9% of them were neutral about the influence of ridicule from other students when they make oral errors. This implies that most of the respondents identified that fear of ridicule from their classmates is an influencing factor to their attitude while some disagreed that it isn't. This shows that other learners' ridicule is also an impeding factor that negatively affects majority of the learners' attitudes to their English language oral errors.

Like those rated item 1 with the same purpose, among the subjects rated item 4, 66% disconfirmed, 22% confirmed and 12% were neutral about that their own attitudes were influenced in that they are less afraid of taking risks of making oral errors. Despite a bit dissimilarity in the number of respondents, both items 1 and 4 indicate that the majority of the subjects indicated that their being afraid of taking risks of making English language oral errors affected their attitudes to their own oral errors. However, some of them said that their being afraid of taking risks of making English language oral errors did not affect their attitudes. It means being afraid of taking risks of making English language oral errors is also one of the factors negatively affecting the majority of the learners' perceptions of their own English language oral errors.

Concerning item 5, from the respondents, 60% disconfirmed, 33% approved and 3% showed neutral opinion that their teachers' negative evaluation of their errors affected their attitudes towards their own spoken English errors. From this it can be understood that teachers' negative evaluation did not influence the attitude of most of the students towards their own spoken deviations though it does for some of them. Teachers' negative evaluation in this case is not a problem for most of the students.

In the case of item 6, 74% of the respondents approved, 19% of them disapproved and 6% of them have undecided attitude about that their attitude towards their spoken errors are affected by their teachers' frequent correction of their own oral errors. This may imply that the attitude of about majority of the students is negatively affected by their teachers' redundant correction of their own oral errors.

On item 7 among the subjects, 71% agreed, 24% disagreed and 5% were neutral that their classmates' positive feedback to their own English language oral errors has influenced their attitude to their English language oral errors. This perhaps may show that the attitude of most of the students is positively influenced by their classmates' constructive feedback to their errors but this is not true for some of the students. As to this and evidence from item 2 above, for the majority of the students their classmates' constructive feedback to their own oral errors has partly contributed for their positive view to their own oral errors.

When we glance at the responses to item 8, 29% of the subjects approved, 65% of them disapproved and 6% of them were neutral that their classmates' positive attitudes have impact on their attitude to their own English language spoken errors. This may tell us that the attitude of some of the students is positively influenced by the positive attitudes of their peers to their own oral errors. However, this may not be real for most of the students. It may be inferred from this that other learners' positive attitudes have erroneously shaped most of the students' attitudes to their own English language oral errors.

In item 9, 66% confirmed, 31% disconfirmed and 3% were neutral that their English teachers' positive attitudes have influenced their attitudes to their own English language speech errors. This tends to indicate that most of the students have positive view towards making English language oral errors as a result of their teachers' positive attitudes to their oral errors.

The result of response to item 10 shows that out of the raters, 63% disconfirmed, 29% confirmed and 8% have undecided opinion that their attitude to their oral errors is affected because their teachers are

sometimes tolerant of their oral errors. This may indicate that most of the students' attitudes to their spoken errors are negatively shaped by their teachers' intolerance of their errors.

As displayed in Table 1, response to item 11 gives the data that 76% of the subjects agreed, 22% disagreed and 2% were neutral that their attitude on their own English language oral errors is affected because of their teachers' expectation of perfect accuracy on them. The implication is that the majority of the students' attitude to their own English language oral errors is affected in that their teacher demands perfect accuracy on them when they speak English.

The Table also reads that from the respondents 59% disapproved, 35% approved and 4% had undecided opinion that their attitude is affected due to the fact that their teacher informs them that perfect accuracy is unrealistic in learning foreign language. From this we can deduce that the attitude of most of the learners to their own English spoken errors is not positively influenced by their teachers' advice that perfect accuracy in learning to speak FL is unrealizable.

As it can be seen from the Table, 63% of the respondents disagreed, 33% of them agreed and 4% of them were neutral that their attitude is influenced by their feeling that perfect accuracy in speaking foreign language is impossible at once. This tends to imply that the attitude of most of the students to their own English language oral errors is affected because of their unrealistic belief that total accuracy in speaking FL is achievable at once.

Similar to the responses to item 13 above, among the subjects, 71% approved, 27% disapproved and 2%

undecided that their attitude to their own English language oral errors is affected by their demand of perfect accuracy in speaking English. This seems to reflect that their demand of perfect accuracy contributed to wrongly influence their attitude for the majority of the students. It can be deduced here that the majority of the students' demand of perfect accuracy in speaking English language made them to expect total correctness more than passing their message in speaking.

The major results of this part can be discussed here. In the category of factors identified as causes for positive attitudes are items 4, 7, 8, 9, 10, 12 and 13. Though these items are expected to have positive influences by nature, majority of the students' attitudes to their oral errors were negatively influenced by them. The only item that positively influenced the students' attitudes towards their English language oral errors is item 9. On this item, most (66%) of the students indicated that their English teachers' positive attitudes to their oral errors influenced them positively. However, some (31%) of them were negatively influenced by the issue.

On the other hand, factors spotted as causes for negative perceptions are 1, 2, 3, 6, 11, and 14. As it is indicated by the students, majority of them were negatively influenced by all of these items.

IV. Conclusion

In general, majority of the students have identified that they fear of their classmates' ridicule and negative evaluation, and their English teachers' negative evaluation on their own English language oral errors. Consequently, these factors have influenced their attitude probably in the wrong direction. Likewise, their English teachers'

information about impracticality of perfect accuracy of foreign language at once has promoted their attitude towards their oral errors. Majority of the students disagree that perfect accuracy in speaking FL is impractical. They always expect perfect accuracy in speaking English and it seems to reflect that this expectation has negative impact on their attitude to their own English language oral errors.

Furthermore, they also feel that their attitude to their own English language oral errors is hindered by their teachers' unrealistic expectation of perfect accuracy on them when they try to speak English. This, as to Dulay, Burt and Krashen (1982) and Yang (2010), will result in inhibition of students' oral production until, as they think, perfection is achieved. It could be deduced from the findings that majority of the learners identified that they are afraid of taking risks of making errors. They also always expect total accuracy in speaking English and their English teachers' frequent corrections of their errors have negatively influenced them. They think that their teachers' expectation of perfect accuracy on them during English language oral practice has negative influence on them to practice English language orally.

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Effect Of Silixol Plus On Germination And Growth Of Rice

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Abstract- A Seed germination study was conducted at Department of Agronomy, Annamalai University, India during February 2019 to study the effect of silixol plus on germination and growth of rice. The treatments comprised of five levels of silixol plus viz., 0 ppm (T₁), 1ppm (T₂), 2 ppm (T₃), 3 ppm (T₄) and 4 ppm (T₅) and were laid out by adopting randomized block design (RBD) with four replications. Among the different levels, seed soaking with Silixol plus @ 2 ppm recorded higher values for seed germination percentage on 3, 5, 7 and 9th day after sowing. The same treatment recorded higher values for growth parameters of rice seedling viz., shoot length, root length, vigour index, fresh weight, relative root and shoot elongation rate on 9th day after sowing. This was followed by silixol plus @ 1 ppm and on par with each other. When the concentration of silixol plus exceed @ 2 ppm, the germination and growth on rice seedlings were gradually decreased, even lesser than control (0 ppm) at Silixol plus @ 4 ppm. Therefore, this study showed seed soaking with silixol plus @ 1 ppm concentration is a viable practice to enhance the germination and growth of rice.

Index Terms- silicon, rice, germination, growth

I. INTRODUCTION

Rice is the world's major food crop next to wheat. It has been cultivated in more than 100 countries in an area of 155 m.ha with the production of 596 m.t. India ranks second next to china in term of rice production. In India, it is grown in 44.80 m.ha and contributes 131 m.t food grains to the nation, but the productivity is 2929 kg ha⁻¹. Rice is widely grown in all India's agro-climate zones. In recent year, rice production in India is started shrinking due to late commencement of monsoon particularly in south India and farmers are moving towards direct dry sowing of rice especially in Cauvery delta region. But direct dry seeded rice recorded lesser productivity due to different biotic and abiotic stresses. Lesser plant population due to poor germination, insect pests, diseases and moisture stress greatly are the prime factors affect the productivity of rice under this condition. Therefore, it is essential to maintain optimum plant population by enhancing the seeds germination and to induce biotic and abiotic resistant to rice crop. Seed treatment with agro chemicals is a common practice to increase seed germination and manage insect pests and diseases in rice at the early stages, but traditional agro chemicals will not induce abiotic and biotic resistant to crop. It is therefore important to find a solution to the above stresses.

Silicon (Si) is a beneficial element for plant growth and also found effective in resistance of biotic, abiotic stress and elevate the crop productivity (Sommer et al., 2006). Application of Si produces more biomass which helps to improves light interception and photosynthetic efficiency. Malav *et al*, (2018) reported that addition of silicon strengthens the root canal and supply efficient oxygen to roots and also prevents water loss by evapotranspiration. Enrichment of silicon plant minimized the incidence of various rice pest and diseases (Chandramani et al., 2010 and Jawahar et al., 2019b). Among the cereals, rice is the only one crop accumulates more amount of silicon; an average absorption of silicon by rice is 150-300 kg per hectare and produce high production and productivity. Therefore, from 20th century silicon has been used in Japan very widely and it has been identified as an agronomically essential element and silicate fertilizers have been applied to paddy soils (Ma et al 2001). Generally, silicon supplemented through traditional silicate fertilizer to crops, where silicon is present in amorphous form. But silicon absorb by the plant from the soil in the plant form of ortho silicic acid, which is not widely investigated on rice. The beneficial role of silicon on rice was earlier documented by Jawahar *et al.*(2019a) in rice, but its influence on germination behaviour on rice is still studied. Keeping the above fact in mind, this study was conducted to study the effect of silixol plus on germination and growth of rice.

II. MATERIALS AND METHODS

A germination study on rice due to silicon (silixol plus) was conducted at Department of Agronomy, Annamalai University, India during February 2019. The treatments comprised of five levels of silixol plus viz., 0 ppm (T₁), 1ppm (T₂), 2 ppm (T₃), 3 ppm (T₄) and 4 ppm (T₅) and were laid out by adopting RBD and replicated four times.

Silixol Plus: The sample, silixol plus was obtained as a gift sample from Dr.Neeru Jain, Head-Application Research , Privi Life Sciences Pvt.Ltd., Navi Mumbai, India. It contains 0.6 % ortho silicic acid.

Germination and Measurements

Rice (Variety: ADT 43) seeds were obtained from Annamalai University Experimental Farm. The seeds are cleaned and hundred per cent filled grains were used for sowing. As per the treatment, seed soaking was done for twelve hours in their respective solution before sowing. Fifteen numbers of good quality seeds were sown in petri plate of 9 cm diameter lined with

filter paper and moisten with 5ml of distilled water and kept at room temperature. Seed germination was recorded on 3, 5, 7 and 9th after sowing. The growth parameters of seedlings viz., shoot length, root length; vigour index and fresh weight of individual seedling were recorded on 9th after sowing.

Vigour index was worked out as suggested by Abdul- Baki and Anderson (1970).

$$\text{Vigour Index} = \frac{\text{GP} \times \text{MSH}}{100}$$

Where,

GP = germination percentage

MSH = sum of shoot and root length.

Relative elongation rate of shoot and root rate were calculated by using the following equation suggested by Rho and Kil (1986).

$$\text{RSER} = \frac{M_s}{M_c} \times 100$$

Where,

RSER = Relative elongation rate of shoot

M_s = Mean of shoot length of tested plant

M_c = Mean of length of control

$$\text{RRER} = \frac{M_r}{M_c} \times 100$$

Where,

RRER = Relative elongation rate of root

M_r = Mean of root length of tested plant

M_c = Mean of length of control.

Statistical analysis

The data on germination and growth of rice was statistically analyzed and critical difference was calculated at 5 % probability level (Gomez and Gomez, 1994).

III. RESULTS AND DISCUSSION

Effect of Silixol plus on germination of rice.

Seeds soaking with silixol plus greatly influenced the germination of rice on 3, 5, 7 and 9th day after sowing (Table 1). The germination percentage ranged from 52.33 to 74.99, 68.33 to 93.32, 73.32 to 94.99 and 76.66 to 96.66 per cent on 3, 5, 7 and 9th day after sowing, respectively. Among the levels, seeds soaking with silixol @ 2ppm recorded higher germination percentage in all the days of observation. It was 74.99, 93.32, 94.99 and 96.66 per cent is increased over 0 ppm on 3, 5, 7 and 9 days after sowing (Fig.1). This was followed by silixol plus @ 1ppm and were on par with each other. Increased germination percentage due to seed soaking with silicon through silixol plus enhanced the cell

extension through formatting Si-polyphenol complexes and lignin which caused loosening of cell wall which caused higher germination percentage. Nita Babaso Patil *et al.* (2018) revealed that the concentration of silixol plus exceeds 2ppm, the germination percentage was gradually decreased. It was found that seed soaking with silixol plus @ 4ppm recorded lesser germination percentage than 0 ppm. The lesser germination under silixol plus @ 4 ppm might be due to higher accumulation of silicon on the seed coat increased the cell wall sustainability by forming a hard layer may be delayed the emergence of radical resulted in lesser germination percentage at 4 ppm. This result was accordance with the earlier reports of Sahebi *et al.* (2015).

Effect of Silixol plus on growth of rice.

The data observed on seedlings growth parameters (Shoot length, root length, vigour index and fresh weight) Table 2. Seed soaking with silixol plus significantly influenced on seedling growth of rice. The shoot length ranges from 1.25 to 4.09 cm and root length ranged from 2.5 to 7.27 cm on 9th day after sowing. Among the treatments, seeds soaking with silixol plus @ 2 ppm recorded highest shoot length and root length of rice and were 4.09 cm and 7.27 cm, respectively which was on par with 1ppm and recorded the shoot length of 4.02 cm and root length of 7.24 cm. The higher values on growth characters due to silixol plus @ 2 ppm might be due to increased cell division, elongation and cell expansion caused by silicon nutrition. This result was witnessed with effect of silicon on Relative elongation rate of shoot and root of rice (Fig 2). The relative elongation rate of shoot ranged from 50.81 to 166.26 per cent and relative elongation rate of root ranged from 43.17 to 125.64 per cent respectively. Among the treatments, the highest relative elongation rate of shoot was recorded @ 2 ppm (166.26 %) followed by 1 ppm (163.04 %) and relative elongation rate of root of 125.64 % at 2 ppm followed by 125.04 % at 1ppm. The same treatment registered highest vigour index of 1098.54 which was followed by 1ppm (1050.89). The increased of vigour index could be due to improvement on germination and growth of rice seedlings characteristics of rice (Feizi *et al.*, 2013). Seeds soaking with silixol plus @ 2 ppm also caused highest fresh weight (1.78 g) among the others due to increased seedling growth. This was comparable with 1ppm (1.67 g). The lesser values on growth parameters were recorded under silixol plus @ 4 ppm due to delayed germination and poor growth of seedlings.

Table 1: Effect of Silixol plus on seed germination of rice.

Treatment	Germination (%)			
	3DAS	5DAS	7DAS	9DAS
0 ppm	58.00	73.99	78.99	86.99
1 ppm	69.99	88.33	93.33	93.33
2 ppm	74.99	93.32	94.99	96.66
3 ppm	66.65	84.99	88.32	91.66
4 ppm	52.33	68.33	73.32	76.66
SEd	2.91	2.88	2.61	2.27
CD at 5%	5.16	6.29	5.70	5.94

Table 2: Effect of Silixol plus on growth parameters of rice.

Treatment	Shoot length (cm)	Root length (cm)	Vigour Index	Fresh weight(g)
0 ppm	2.46	5.79	717.66	1.46
1 ppm	4.02	7.24	1050.89	1.67
2 ppm	4.09	7.27	1098.54	1.78
3 ppm	3.24	6.23	868.02	1.28
4 ppm	1.25	2.5	287.47	0.81
SEd	0.18	0.08	26.02	0.07
CD at 5%	0.39	0.19	56.70	0.15

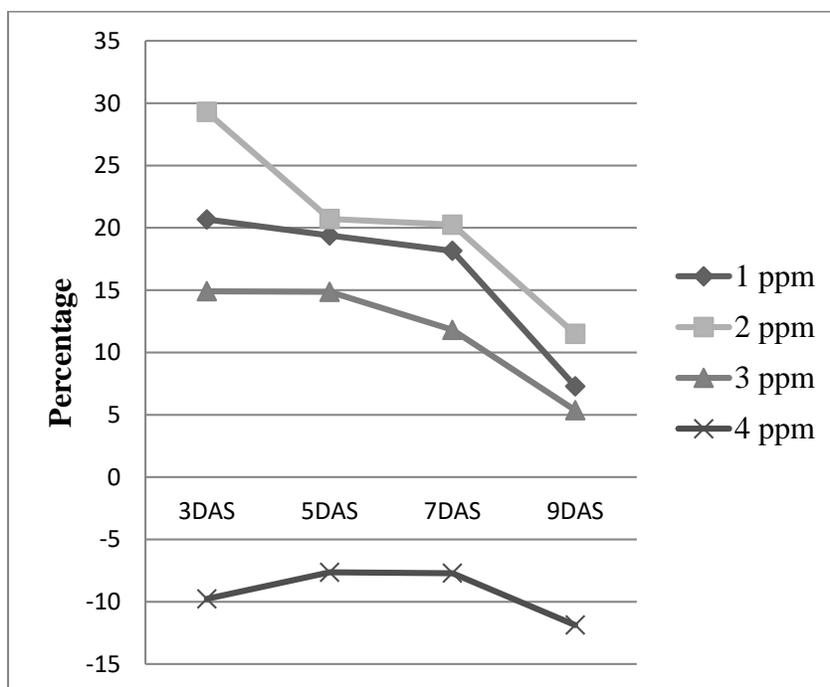


Figure 1: Effect of Silixol plus on per cent increase or decrease of germination percentage over 0 ppm

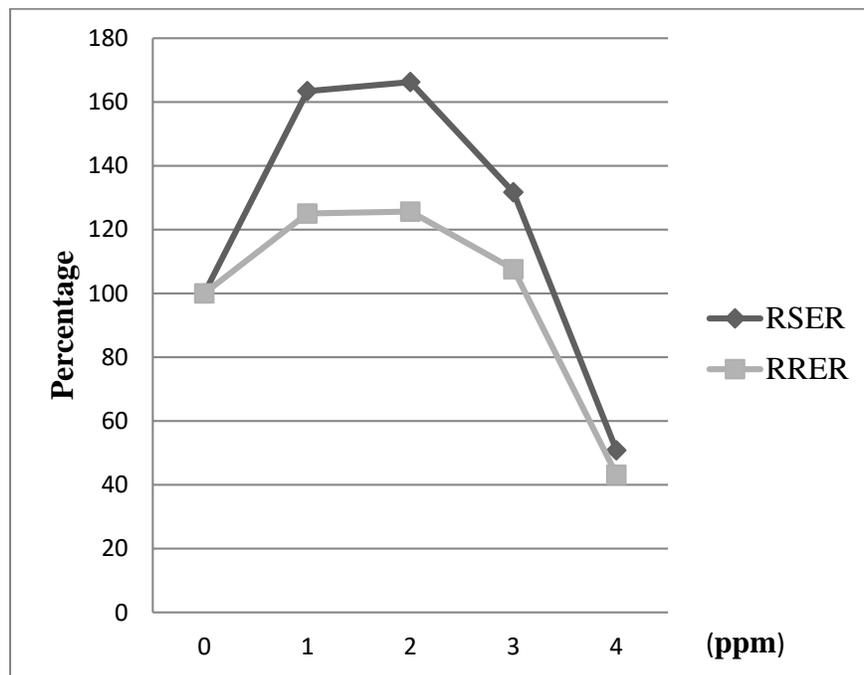


Figure 2: Effect of Silixol plus on relative elongation rate of shoot and root of rice.

IV. CONCLUSION

In this present research, it can be revealed that application of silicon to the seeds through silixol plus by seeds soaking had a positive role on germination and growth of rice seedlings parameters. Further, seeds soaking silixol plus @ 2 ppm and 1 ppm showed similar effect on rice germination percentage and seedling growth and the response is decreased at higher levels. Hence seeds soaking with silixol plus @ 1ppm can be recommended to enhance the germination and growth of rice.

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Code switching at reception classes in Botswana: a strategy to academic excellence

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Abstract: This case study responds to a growing concern among educationist of the need for provision of quality education at early childhood level. The focus of this particular study was on code switching at reception classes in Botswana as a strategy for academic excellence. The idea for the study was triggered by the fact that Botswana is a multicultural society. The study was carried out at schools in the Kgalagadi North sub-district among eight (8) schools in the Hukuntsi cluster. Expressly, the study set out to assess teacher educators' perceptions of code switching and to find out their views about the benefits of code switching. Data was collected through interviews and questionnaire. In relation to perceptions about the practice of code switching, a conclusion can be made that teachers differ widely. Findings revealed that majority of teachers view code switching as a feasible strategy at preschool level. This conclusion is made from findings which showed ardently that children learn best when they are taught in their mother tongue. However, a small minority did not agree with the idea and this creates room for further enquiry into the perceptions of teachers about code switching at national level. The study also concludes that code switching has positive and negative educational effects. Positively, facilitates the language learning process, promotes participation among others benefits. The study has on the contrary shown that at code switching has potential to impede the development of English and setswana language proficiency. The study recommends to Ministry of Basic Education to consider engaging in a robust engagement to develop other indigenous languages in Botswana and their eventual elevation to the same status. It is hope such move will contribute to educational gains.

Keywords: early childhood education, code switching, language proficiency, teaching strategies.

Introduction

In public schools in Botswana at all levels learners are taught Setswana and English as subjects and Setswana, the venegular language is only used as a medium of instruction from standard one to three, from standard four students are taught in English as per the recommendation by the National Language Policy. This makes the conditions in the classrooms difficult for students who are non-Setswana and or English speakers as they feel excluded from these schools. This exclusion affects their performance in a negative way as they end up getting lower grades. For example, there is linguistic mismatch as children learn in a language that they do not speak at home (Pansiri, 2011). This scenario is captured by Nyati-Ramahobo (2009) when she says that "ethnic minority children have to go through transitional submersion programs in that they are first of all, submerged into the national language (L2) and later into English (L3)" (p.36). The implication is that children from minority groups are forced to use Setswana in the classroom and learn in Setswana, and later on they are supposed to use English as a language of instruction. This submersion in a way forces these children to forget about their mother tongue language because it is prohibited in schools. They can only speak their languages when they are at home. Most children meet Setswana at the age of five at reception classes and they are supposed to learn the language fast as they are supposed to be taught Setswana as a subject and be taught in Setswana from standard one to three (Botswana Government, 1994).

English as medium of instruction (EMI) was defined by Dearden (2014) as "the use of English language to teach academic subjects in countries or jurisdictions where the first language (L1) of the majority of the population is not English" Pp4.

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In Botswana English is also used as the enabling communication tool in the teaching and learning process. In any teaching and learning situation the language of instruction plays a vivacious role in facilitating learning of subject contents. So it is necessary for the teachers and learners to use the language of instruction appropriately for enhancing effective teaching and learning. In other words, when there is conflict regarding the medium of instruction that is used at early learning stage, the situation may have negative effect on the subsequent educational level of the learners. This research study was conducted to cater for learners who are not familiar with the medium of instruction been English and Setswana in Setswana subject lessons used in schools. Jacobson (2012) argues that, if learners are disabled in the language that is used as a medium of instruction, then the learning process cannot take place effectively. Subsequently, language can be a factor in either providing or withholding access to education. It is therefore important that this particular resource be used so as to achieve effectiveness of communication in the classroom as well as facilitating the teaching and learning process. As such, the main focus of this research was to explore teacher's perception on code switching as a medium of instruction. This paper argues that to better understand the occurrence of code-switching (CS) in Botswana classrooms, an awareness of the language situation in Botswana is imperative. Equally important is an understanding of the role of English in Botswana. According to Batibo and Smieja (2000), research has not yet established the exact number of languages in Botswana owing to the blurred distinction between a language and a dialect. Notwithstanding the above, it is generally agreed that Botswana has at least 26 languages, including English and Setswana (Webb & Kembo-Sure (2000), Molosiwa (2006) and Nyati-Ramahobo (2004).

The authors of this paper maintain that the phenomenon of switching from one language to another should be seen as a new method of explaining things in the classroom. This is because teachers face a lot of challenges when teaching lessons in a class where pupils are not familiar with official language used in a class. Considering the level of understanding of the learners it becomes very difficult to explain some topics in the language of instruction for easy understanding. This matter without doubt calls for alternation between languages in a form of code switching to aid the flow of ideas among teachers and learners.

Conceptual framework

Conceptual framework adopted by this study is, *Mother tongue as a medium of instruction*. The most important issue is to understand what mother tongue is and its relationship to teaching and learning. Defining mother tongue Nigel and Ansaldo (2010) posit that "mother tongue is part of the personal social and cultural identity" (p. 63). It is the language that brings the reflection and learning of social patterns of acting and speaking (Terry, 2010). Mother tongue is viewed as important for the academic performance of the learners. Further, Nkosana (2014) maintains that the mother tongue equips the child with the foundation for the ability to learn. The child finds it easier to learn their second language and other school subjects. It has also been debated that children should be taught mainly through their mother tongue in schools for the first 6-8 years (Skutnabb-Kangas, 2009). Stegen (2011) asserts that children can be able to speak confidently with their own accent, and they know the simple grammar and many existing words. It is for this reason that this study wants to explore teachers perceptions about code switching with a view to recommend the recognition of code switching as a medium of instruction technique in our schools especially at lower pre and lower primary school level.

Statement of the problem

Communicative competence in any given language or code is very important especially in a school context as learners are able to comprehend concepts when they are presented in a code that is more familiar to them. Both English and Setswana are taught as compulsory and examined in primary education in Botswana. The selected languages may facilitate or impede the quality of education. The language of instruction can be a problem if the content taught is not in the learner's first language. Children in Kgalagadi North area where this study was conducted speak Sengologa/Sekgalagadi, or Sesarwa as their first language. Most of these learners are not exposed to Setswana and English as such when they start preschool, they encounter communication problems. Therefore, supplementing Setswana/English with another language which the learner is acquainted

with can lead to a better understanding of the content being taught. When children have difficulty in conceptualising concepts and content been taught, it is not surprising that psychosocial and emotional adjustment problems supervene.

Purpose of the study

The purpose of this study was to examine code-switching in connection to teachers perception when teaching in ECD classrooms with a view to deduce the profits of code switching as a medium of instruction strategy.

This study was informed by the following objectives:

1. To find out the perceptions of teachers on using first language in second language teaching.
2. To determine the profits and constrains of code switching as a medium of instruction technique.

Literature review

Botswana language of instruction policy

Language educational policy can be defined as “mechanism that impacts the structure, functions, use, or acquisition of language” (Shohamy, 2012). It is these policies, especially in a centralized system, that represent a language manipulation of the what kind of language or languages should be used as a medium of instruction and to what degree that usage is acceptable. In most cases, educational staff of a given institute work, according to Shohamy (2012), as agents of implementing these policies without questioning its quality, appropriateness and relevance to the successful learning for learners.

Scholars, educators, politicians and pundits are among those who have significantly influenced language education worldwide, though ultimately language education policies are formulated based on political considerations. This might explain the reason why Botswana, at independence, retained English as its official language and adopted Setswana as its national language. Prior to the inception of any language in education policy in the country, the practice was to instruct primary school pupils in Setswana for the first two/three years and thereafter change to English. In 1977, a decisive step was taken to formulate a Language policy, Education for Kagisano (Education for social harmony) which stipulates the use of English as medium of instruction from standard 3 (Government of Botswana 1977). It was noted, however, that the policy decision to use English as the medium of instruction from standard 3 was discriminatory against Setswana, the national language. In 1992, another National Commission on Education was constituted to address new challenges in the educational system. Although The Report of the National Commission on Education (1993) recommended that the use of English for instruction should be deferred till standard 5, the Revised National Policy on Education (1994) prescribed English as the medium of instruction from standard 2. This change resulted in the submission of a minority report, was premised on the belief that introducing English to the learners, who apparently were performing poorly in the language, much earlier would improve their performance. In some areas where children are not familiar with the official languages used in schools, some teachers tend to code switch so that learners can understand better (Banks and Banks, 2013).

Remunerations of code switching as a strategy

According to Metila (2009) code switching helps to improve class participation by inducing a relaxed class atmosphere that allows students to perform much better. Along the same vien, Abad (2009) maintains that code switching manages to lower the effective filter and this consequently establishes rapport and creates an atmosphere of informality in the classroom between

the teachers and students aiding in a more democratic and critical learning environment for the students. More so, Lee (2011) in his research affirms that the discourse (code switching) used by the students outside the classroom should be allowed inside the classroom discussion processes because it helps the students contribute in the discussions process and bridges any social and cultural gap. Jacobson (2012) argues that socio-psychological factors play a significant role in code switching in a bilingual classroom. He further argues that code switching helps the speakers to express themselves and present pragmatic meanings.

Further, code-switching is described as a positive phenomenon that is advantageous for both teachers and students, for students' language acquisition, and for bridging a gap in the knowledge. First, it can be more convenient for teachers and students to alternate between languages if they have one language in common (Hall & Cook, 2012; Tabaku, 2014). This means code-switching serves a multiple functions in terms that teachers can use code-switching for instructional purposes, such as classroom management, explanation of new information, etc. Second, Baeoueb and Toumi (2012) and Lopez and Gonzalez-Davies (2015) identified code-switching as an approach, which is beneficial for target language acquisition. In this paper we argue that when a speaker is not fluent in the target language, it is code-switching that can help to further communication and make it meaningful.

Lin (2013) suggested that both teachers and students code-switched to a larger extent in informal situations whereas the target language dominated in formal ones. Students find classroom interaction more natural and easy when code switching is taking place. This conducive atmosphere that code-switching can contribute to is important in the teacher-student relationship since it gives them an opportunity to communicate in a more informal way where the risk of misunderstandings can be avoided. In formal situations, code-switching can be used to make the teaching more effective. This can be made possible when a teacher finds it important to explain what is in the curriculum or another academic text in a language or languages that a student can understand.

In essence, using code switching in the classroom fosters a positive ambience according to Metila (2009). Bautista (2009) concurs with Metila (2009) that code switching can transform the atmosphere of a classroom from being too formal to informal thereby allowing collaborations among the learners in group works and also aids in the interactions and discussions in the classroom. According to Bautista (2009) code switching is the simplified strategy that students with poor English language proficiency use. In the case of Botswana, we also include learners with poor Botswana proficiency. Whilst, Metila (2009), argues that the use of code switching in a bilingual classroom fulfills a pedagogical function when it makes a challenging subject matter comprehensible to students. In other words, the use of code switching in a bilingual classroom seems beneficial because it helps in explaining abstract concepts and in defining difficult terms to students.

Wright (2010) emphasised that pupils' native language should not be ignored; instead schools should respect their pupils' mother tongue. Moreover, the author defined and discussed primary language support, which is used to support pupils' L2 learning. The purpose of primary language support is to instruct pupil in the target language and to make it as comprehensible as possible in order for the pupils to acquire the L2 better. The concept of primary language support was further developed by describing that primary language support makes it easier for teachers to acknowledge if the pupils understand the concept of what was being taught, but could not answer in the target language, or if the pupils did not understand at all and as a result the teacher needed to re-teach the concept (Wright, 2010).

This phenomenon of switching from one language to another should be seen as a new method of explaining things in the classroom. This is because teachers face a lot of challenges when teaching lessons in a class where pupils are not familiar with official language used in a class. Considering the level of understanding of the learners it becomes very difficult to explain some topics in the medium of instruction for easy understanding. The matter calls for alternation between languages in a form of code switching to aid the flow of ideas among teachers and learners.

Methodological orientation

In this study, both quantitative and qualitative approaches were employed. As such, quantitative and qualitative methods were used alongside each other, with each type of data contributing to answering the same or different research questions. Data for this study was obtained from teachers and school management staff through the administration of questionnaire and interviews. The use of various instruments aided in triangulation and therefore bringing to the fore a better understanding of the code switching practices as a medium of instruction. In the identification of schools, purposive sampling was applied to select all schools in the Hukuntsi cluster. This move was triggered by the fact that there are only 8 schools in the cluster. As a matter of fact to avoid a small number of participants all schools had to be selected.

When it comes to the identification of participants, purposive sampling was again used to select two (2) preschool teachers from all the 8 schools. Purposeful sampling was used to make certain that those participants handpicked are familiar with ECD practices and principles. Patton (1990) concurs that purposeful sampling is a non-random method of sampling where the researcher selects "information-rich" cases for in-depth study. This means that information-rich teachers in this case are those who are teaching reception classes. Like indicated above, each of the four (8) schools, has a teacher and teacher aid. This was to make a sample size of 16 participants but one school was found to be having 2 teacher aids and they were all included in the study hence we ended up with 17 teacher participants and 8 Heads of Department making a total of 25 participants. In this research, a set of questionnaire was distributed to preschool teachers. Questionnaires are perhaps the most common and popular way of gathering data in research. They are used to obtain the opinions, beliefs and experiences of research participants.

According to Cohen et al., (2006) an interview is a two way conversation or oral questionnaire initiated to provide valid data and to learn about ideas, beliefs, views, perceptions and experiences about a phenomenon under study. In-depth interviews were also used to collect primary data. In this interview, the collection data was through direct contact between the interviewer and respondents presumed to have certain experiences that enhance understanding of the problem under investigations (Denscombe, 2001). In-depth interviews is preferred for this study because unlike questionnaires, the researcher can immediately validate the data when sensing that the respondent is giving false information through non-verbal cues, including facial expressions and tones of voice (Modesto & Tichapondwa, 2013). The in-depth interviews were semi structured and as such had open ended questions with a view to allow alteration to the sequence of the questions at any time hence probing for more information. They match the researchers' strategy of inquiry because they will enable the researcher to probe further into issues.

The use of various data collection techniques by itself went a long way in increasing the validity of the data collected. Triangulation of data as explained by Olsen (2004) involves mixing data collection methods and it is believed to help in validating data. Also the data collection instruments were given to experts in research at the University of Botswana and Bai sago University to establish their face and content validity. To ensure reliability the instruments were piloted on teachers at two (2) schools in the Kgalagadi South Region with similar characteristics as those in the Kgalagadi North. The test-retest form of reliability checking was used where teachers were given the instrument to complete and after a week it was administered again to the same teachers. This was done to determine whether the instrument will yield the same results on the two occasions. Bell (2012) cautioned that all questionnaires used in research need to be piloted to establish as to whether all the questions and instructions are clear and to enable the researcher to eliminate any questions that do not answer to any of the research questions.

Ethical protocol for data collection

In Botswana it is required that before pursuing any research in the country, permission should be sought from the permanent secretary of the concerned ministry. Therefore, researchers sought for permission to conduct the study and followed all protocol of data collection such permission seeking from schools and participants. Participants were assured to confidentiality and anonymity.

PRESENTATION AND INTERPRESTATION OF FINDINGS

The purpose of this study was to examine code-switching in connection to teachers perception when teaching in ECD classrooms with a view to deduce the profits and constrains of code switching as a medium of instruction strategy. The study was guided by the following objectives:

1. To find out the perceptions of teachers on using first language in second language teaching.
2. To determine the profits and constrains of code switching as a medium of instruction technique.

Data for the entire study is analysed by means of descriptive statistics using frequencies and percentages to determine responses from respondents. For the questionnaire, a Likert scale was used to show responses from different respondents. The results obtained where presented in line with each objective under the following headings:

1. Perceptions of teachers on using first language in second language teaching.
2. Benefits of code switching

This section presents respondents closed-ended questions and semi-structured interview items. The items are grouped according to research objectives and interpreted under them using frequencies, tables and percentages. For open ended interview items narrative approach to analysis of data was used.

Note: SA-strongly agree, A-agree, SD-strong disagree, D-disagree

Codes for HoD,s (HoD, 1,2,3,4,5,6,7 &8)

Objective 1: To find out the perceptions of teachers on using first language in second language teaching.

This objective is addressed by items 3-4,6,7,10 and 11 of section 2 closed ended items of teachers and item 1 and 2 from school management interview.

Table 1: the perceptions of teachers

Item no:	SA	A	SD	D
3.Children learn best when they are taught in their mother tongue	2 (12)	11(65)	1 (6)	3(18)
4. The use of other languages in the classroom will result in a decline of results.	1 (6)	9 (53)	2 (12)	5 (29)
6. I code switch while giving instructions	2 (12)	12 (71)	0	3 (18)
7. The policy requires that, code switch during teaching and learning.	4 (24)	3 (18)	0	10 (59)
10.I think learners understand concepts better when I code-switch	4 (24)	7 (41)	1 (6)	5 (29)

In response to objective 1 on the item on whether children learn best when they are taught in their mother tongue, 11 respondents representing 65% indicated that they agree with the statement. This was followed by 3 respondents who indicated that they disagree with the statement. Two (2) others representing 12% and one (6) indicated the strongly agree and strongly

disagreement options respectively. On item 4-the use of other languages in the classroom will result in a decline of results. Findings show that a majority of 9 out of 17 respondents indicated that they agree with the statement, 5 (29%) were for disagree, 2 chose strongly disagree while 1 respondent choose the option strongly agree.

On the question of code switch while giving instructions, a huge majority of respondents indicated that they agree with the statement meaning that they code switch while giving instructions. This was followed by 3 who choose the option disagree and 2 who were for the option strongly agree. When asked to show whether the policy requires code switch during teaching and learning, 10 respondents representing 59 %, 3 (18%) and 4 representing 24% indicated the disagree, agree and strongly agree options respectively. None of the respondents' strongly disagreed with the statement.

Respondents were asked to state whether in their view learners understand concepts better when they code-switch. Responses revealed that was distributed responses. For instance the table above shows that 7/17 indicated that they agree, followed by 5 (29%) who disagreed,4 representing 24% strongly agreed and only one (1) representing 6 % strongly disagree. Along with this question was a question on whether or not code switching will make it difficult for learners to understand second language (L2). In response to this question or item, majority of 12 out of 17 respondents indicated that they disagree with statement. This was followed bt 3 respondents who opted for the strongly agree while 1 went for the agree and another 1 (6%) chose the strongly disagree option.

School management in the form of Heads of Departments (lower) also took part in the study. When asked to share their views on the use of first language in second languadge teaching they provided mixed opnions. Some were of the view that the use of first language in second language teaching was good while others felt it was not. One participant (HoD,3) had this to say, ' *In my opinion,the use of first language helps children to understand concepts much better*'.

Another participants (HoD, 8) said,

'for our pupils in remote areas who are familiar with none other but their indigenous languages code switching who help to allow them to follow classroom discussion. Otherwise without the use of first language these little lads would be lost'

The statement above was also shared by participants (HoD,2) who argued that the use of first language in second language teaching is a good initiate which should be adopted by the ministry of basic education as a strategies especially among schools based in rural areas.

Like indicated above, other participants were of the opinion that the use of first language is not good. One participants (HoD, 5) said, '*use of first language in teaching second language is a complete waste of time because examinations are not conducted in first language so basically you are miseducationg and misdirecting poor little children*'.

Participants (HoD, 7) along the same indicated thus, ' use of first language is not profitable because it creates confusion for little children, imagibne you say something in English today and say the same in local language such as sekgalagadi'.

Objective 2: To determine the profits and constrains of code switching as a medium of instruction technique.

The objective was addressed by items 1-2, 5, 8, 9 and 12 from section 2 of the questionnaire.

Table 2; Profits of code switching

Item no:	SA	A	SD	D
1. Code switching will facilitate the language learning process	14 (82)	2 (12)	0	1 (6)
2. code switching is an efficient, time saving technique	12 (71)	4 (24)	0	1 (6)
5. Code switching helps to improve class participation by including a relaxed class atmosphere	12 (71)	4 (24)	0	1 (6)
8. It is effective to use learner’s first language than to teach purely in target language	3 (18)	10 (59)	1 (6)	3 (18)
9.Code switching makes it easy for me to give instructions to pupils	11 (65)	5 (29)	0	1 (6)

Table 7 reveals that the majority of sampled respondents are on ‘strongly agree’ side to item 1 which wanted to find out whether code switching will facilitate the language learning process. This was evidenced by 14 out of 17 respondents who indicated the option strongly agree. This was followed by 2 or 12% who additionally chose the option ‘agree’ and only 1 or 6% indicated that they disagree. None of the respondents strongly disagreed with the statement. On a closer item on- *code switching is an efficient, time saving technique*, a majority of 12 out of 17 respondents were for the strongly agree option, followed by 4 who agreed, 1 or 6% disagreed and none opted for the strongly disagree.

Respondents were asked to share their views on whether code switching helps to improve class participation by including a relaxed class atmosphere. Their responses indicated that majority were on the agree side. This is evidenced in the table above which shows that to item 5, 12 or 71 % strongly agreed and 4 or 24 % agreed. Only 1 or 6% disagreed while none chose the option strong disagree. When asked on the effectiveness of using learner’s first language than to teach purely in target language, responses were distributed across all 4 areas of the likert scale. However, majority were on the agree side as it can be seen that 10 or 59 were for agree and 3 or 18 % were for strongly agree. On the side of disagree, 3 were for disagree while 1 or 6% strongly disagreed.

Like their teachers, Heads of Departments also differed with respect to profits of code switching as a medium of instruction technique. When asked to share the benefitd sof code switching, one participants (HoD,3) SAID, ‘ *In my experience, it makes communication easier with almost everyone. I remember when I was at primary we were in class with pupils who were not familiar with English nor Setswana and teachers used to emphasise some points in their vernacular languages and they would seem to follow*’. Another participant (HoD, 8) along the same vein said, ‘ *code switching makes all pupils free and recognised in the classroom and in some way improves their confidence and willingness to learn*’.

Findings show that other participants who saw the benefits of code switching indicating that its benefit is that ppils will feel accommodated in school and instructional activities and that it will help them to understand concepts much better.

Other participants (HoD, 1, 5,6,7,4) felt there are no benefits of code switching. These participants only see constrains and disadvantages of code switching. One participant (HoD, 6) said, ‘ *code switching does not help serve a full purpose of the course and as such I can say it is profitable*’. Another participant (HoD, 4) closer in opinion to HOD 6 indicated that *code switching is a temporary strategy that can be used to emphases a point but does not have long lasting profits to pupils.*

Discussions

It was found that teachers have diverse views about code switching as a teaching strategy. Findings revealed that majority of teachers view code switch as a viable strategy for preschool level. This conclusion is made from findings which showed that majority of 65% of respondents indicating that children learn best when they are taught in their mother tongue. However, a small minority did not agree with the statement and this creates room for further enquiry into the perceptions of teachers about code switching. Along the same teachers differed on the item which wanted to find out whether *the use of other languages in the classroom will result in a decline of results*.

While majority agreed with the statement but also a good number disagreed with the statement. It can be argued that teachers are divided in their perceptions of code switching. While majority support the idea as a viable strategy but those who disagree cannot be ignored. The findings are in agreement to Kieswetter (2017) who specified that code-switching is a method of conversation that depends on people or situations, in which it occurs. The author is understood to say to be saying that code switching is context laden. This means it will all depend on the context. Simply put, there are preschools learners for whom code switching can work and those for whom it cannot work. For teachers to make good decisions when faced with diverse daily issues in their classrooms, Bansal (2009) advises that they must be aware of numerous ways in which learning can unfold in the contexts of development, learning disparities, language and cultural influences and individual temperament, interests and approaches to learning.

With regard to whether in their view the policy requires code switch during teaching and learning, 10 respondents representing 59 %, 3 (18%) and 4 representing 24% indicated the disagree, agree and strongly agree options respectively. None of the respondents' strongly disagreed with the statement. This was found to be a positive outcome which shows that teachers are aware of the policy.

Findings show that teachers view code switch as a strategy to unpack concepts. This was revealed when respondents were asked to indicate their views on the item which wanted to find out whether in their view learners understand concepts better when they code-switch.

To this item mixed views were recorded. That is to say some respondents agreed with the statement while others were on the 'disagree' side. Along with this question was a question on whether or not code switching will make it difficult for learners to understand second language (L2). The findings revealed that code switch by no means will make it difficult to understand second language. It implies that if well done for a particular purpose code switch can function without interfering with the learning of second language. Speakers switch codes to negotiate a change in social distance between themselves and the other participants in the conversation through the choice of different codes (Myers-Scotton, 2009).

Generally with respect to objective 1 on opinions on code switching, management staff who supervise teachers and teacher Aids differed. Some felt it is a viable strategy especially for pupils who are not familiar with the language of instruction. They argued that code switching would enable pupils to understand concepts better. On the other hand those were against the use of code switching claimed that code switching has no permanent benefit. They thus indicated that yes a pupil may grasp the concept at that point in time but such doing has no profit as examination and test will not use mother tongue. Simply put for these participants code switching will only confuse little children and virtually waste their time of learning second language.

Objective 2: To determine the profits of code switching as a medium of instruction technique.

This objective wanted to find out the views of teachers regarding the profits of code switching. A general finding from various items which supported the above objective is that code switch is seen by teachers having huge benefits. Majority of people in the world are monolingual and monocultural, incapable of effectively bridging any gaps between the world's diverse set of countries and ethnic groups. A code-switcher can help these disparate groups communicate and reach a mutual understanding (Lee-Wickner, 2016). Expressly, findings show that teachers feel that code switching facilitates the language learning process. A huge majority of respondents of 14 out of 17 representing 82% strongly agreed to the statement that code switching facilitate language learning process. Findings therefore show that code switching is an efficient, time saving technique. A majority of 12 out of 17 respondents were for the strongly agree option, followed by 4 who agreed, 1 or 6% disagreed and none opted for the strongly disagree. Along the same vein, findings show that code switching helps to improve class participation by including a relaxed class atmosphere. This means when a teacher switches to vernacular student participation increase. This may be understood from two side though. In my view from one side this is positive as it shows learners follow and take part in learning after code switching. From a different lens this can be seen as disadvantage since doing so may hinder students from learning and understanding concepts, facts and principles in the language of instruction. In my view code switching has benefits, it is vital for learners to understand concepts, facts and generalisations in the language of instruction. Mind you the language of instruction is also the very same language of assessment. There will be no code switching in examinations rooms. This point was also emphasised by heads of departments who were on the sample. They argued that it is waste of time to teach in one language and assess students in the other. My argument is supported by Mokgwathi & Webb (2018) who posit that code switching does not contribute to developing the learners' proficiency and confidence in speaking English. It is therefore surprising that majority of teachers are so much for code switching. However, it must be understood that teachers in the sample were responding to a study on code switching at preschool level, hence most responses are in favour of code switching. It may therefore be interesting to find out views of teachers on code switching at upper primary school and secondary school level.

Conclusions

In relation to perceptions about code switching, a conclusion can be made that teachers differ widely. Findings revealed that majority of teachers view code switch as a viable strategy for preschool level. This conclusion is made from findings which showed that children learn best when they are taught in their mother tongue. However, a small minority did not agree with the statement and this creates room for further enquiry into the perceptions of teachers about code switching. While majority support the idea as a viable strategy but those who disagree cannot be ignored. The findings are in agreement to Kieswetter (2017) who specified that code-switching is a method of conversation that depends on people or situations, in which it occurs. The author is understood to say to be saying that code switching is context laden.

The study has shown that teachers at the sampled schools engage in Code switching for various reasons and perceive code switching differently. However, code switching is not without a basis; but it is largely used to accommodate the learners' restricted linguistic skills in the language of instruction with a view to assist pupils overcome communication problems caused by their lack of the necessary proficiency in the language used as medium of instruction. The study also concludes that code switching has positive and negative educational effects. Positively, facilitates the language learning process, promotes participation among others benefits. This supported by Canagarajah (2009) who posit that code switching as a teaching strategy enables the use of the learners' home language in a bilingual setting like the classroom.

Findings show that by code-switching to a language spoken by the majority of the learners, the teachers improve the learners' comprehension of the subject content. The study has also shown that at these schools, code switch has potential to impede the development of English language proficiency or Setswana language proficiency. Simply put, teachers of the sampled schools are teaching pupils majority of which are from the sekgalagadi tribes and mostly speak sekgalagadi from home. As a

matter of fact when teacher code switch as often as findings revealed in the process proficiency in the Setswana language can be affected.

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Developing A Sustainable Solid Waste Management Strategy For Nigerian Urban Centers

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Abstract- Solid waste generation and management in Nigerian urban centers is a replica of what is obtained in most cities of Africa and other cities of developing countries. It is characterized by improper collection; transportation and disposal coupled with lack of data to facilitate in planning for sustainability. These problems therefore, informed the need to develop a strategy for sustainable solid waste management. This is in tandem with global initiatives which greatly support the prioritizing of solid waste management as an important facet of sustainable development. This study conceptualized solid waste management system components of generation, handling and disposal for a sustainable solid waste service delivery in Nigerian cities.

Index Terms- Solid Waste Management, Sustainable Development, Urban Centers

I. INTRODUCTION

Out of the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development, adopted by the 193 UN Member States in September 2015, at least 12 SDGs and their pertinent targets have a direct link to solid waste management. In essence, the SDGs have the same driving forces as those that have been driving development of SWM activities over time, namely: public health, environmental concerns, and resource

value, with relatively recent additions of climate change and inclusivity (Wilson, 2007, Rodic & Wilson, 2017).

As a key utility service that more than 2 billion people are currently lacking, solid waste management (SWM) is a crosscutting issue that affects and impacts various areas of sustainable development in each of the three sustainability domains: ecology, economy, and society. The affected areas include living conditions, sanitation, public health, marine and terrestrial ecosystems, access to decent jobs, as well as the sustainable use of natural resources. Emphasizing this issue, the United Nations recognizes World Habitat Day 2018 with calls for increasing imagination and innovation to address global waste management challenges. According to the UN Human settlements Programme (UN Habitat), 99 percent of purchased items are discarded within six months and the world produces two billion tonnes of waste annually.

The SDGs, the Paris Agreement on climate change and the New Urban Agenda (NUA), all address solid waste management. Also, since 2000, the World Bank has committed over \$4.7 billion to >340 solid waste management programs in all six regions of World Bank engagement. (Cleary, 2009, Guerrero et al., 2013, Navabi-Pelesaraei et al., 2017, Rodic and Wilson, 2017, Sharholy et al., 2008, Zhang et al., 2010, Pujara et al., 2019). Therefore improving solid waste management is the main goal of the UNDP-UNEP and Poverty Environment and Initiative (PEI).

Table 1. Relationship between Sustainable Development Goals and Solid Waste Management.

Driver	Sustainable Development		Solid Waste Management (SWM)	
	Sustainable Development Goal (SDG) ¹	Specific Target	SWM Related 'Virtual SDG' ²	
Protection of public health	SDG 11: Sustainable cities	11.1 Ensure access for all to adequate, safe, and affordable basic services; upgrading slums	→ Goal 1. Ensure access for all to adequate, safe, and affordable solid waste collection services.	
	SDG 3: Good health and well-being	3.2 End preventable deaths of children under 5 years	<i>Uncollected waste is often dumped in waterways or burned in the open air, thus directly causing pollution and contamination. Waste also clogs the drains, which exacerbates floods, keeping stagnant water and contributing to water-borne diseases and malaria. Children are among the most vulnerable, so they are affected the most.</i>	
		3.3 End malaria and combat water-borne diseases 3.9 Reduce illnesses from hazardous chemicals and air, water and soil pollution, and contamination		
SDG 11: Sustainable cities	11.6 Reduce the adverse environmental impact of cities; special attention to waste management			
Protection of the environment	LOCAL	SDG 12: Responsible consumption and production	12.4 Environmentally sound management of chemicals and all wastes in order to minimize their adverse impacts on human health and the environment	→ Goal 2. Eliminate uncontrolled dumping and open burning, as the first stepping-stone to achieving environmentally sound SWM practices.
		SDG 6: Clean water and sanitation	6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous materials	→ Goal 3. Achieve environmentally sound management of all wastes, particularly hazardous wastes (either chemical or biological hazardous wastes).
		SDG 15: Life on land	15.1 Ensure the conservation of terrestrial and inland freshwater ecosystems and their services	
	GLOBAL	SDG 7: Affordable and clean energy	7.2 Increase the share of renewable energy in the global energy mix	→ Goal 3. SWM technologies can derive renewable energy from (organic) waste.
		SDG 13: Climate action	SDG 13: Take urgent action to combat climate change and its impacts	→ Goal 3. Adequate SWM practices can prevent emissions of large amounts of greenhouse gases. ^{III}
		SDG 14: Life below water	14.1 Prevent marine pollution of all kinds, in particular from land-based activities, including marine debris	→ Goal 1 and Goal 2. Extending waste collection to all and eliminating uncontrolled dumping will prevent waste (particularly plastics) ending up in the oceans.
Resource value	SDG 12: Responsible consumption and production	12.5 Reduce waste through prevention, reduction, recycling, and reuse 12.3 Halve global food waste and reduce food losses along production and supply chains This SDG also contributes to SDG 2: Zero hunger – End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	→ Goal 4. Substantially reduce waste generation through prevention and the 3Rs (reduce, reuse, recycle) and thereby create 'green' jobs <i>Waste prevention is the highest-ranking option in the waste management hierarchy. It is followed by reuse of products or their parts, and then by recycling of component materials.</i> → Goal 5. Halve per capita global food waste at the retail and consumer levels and reduce food losses in the supply chain. ^{IV}	
Supplementary driver: Industry	SDG 1: No poverty	1.4 Ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources and financial services, including microfinance	→ Goal 4 <i>Reuse and recycling have a significant potential for creation of jobs.</i> → Goal 1 and Goal 4	
	SDG 8: Decent work and economic growth	SDG 8: Promote inclusive and sustainable economic growth, employment and decent work for all	<i>In developing countries, SWM services are often provided by individuals and small and microenterprises. Any measures applied to support them will improve livelihoods and directly contribute to SDGs 1 and 8.</i>	

Source: Rodic & Wilson, 2017

Municipal solid waste management (MSWM) refers to the collection, transfer, treatment, recycling, resource recovery and disposal of solid waste in urban areas). MSWM is an important facet of sustainable development for any country and global initiatives greatly support the prioritizing of SWM (Ndum, 2013). Municipal solid waste systems are essential component of the environmental infrastructure in human settlement. This system comprises all the activities undertaken from the point of waste generation up to the final disposal. It is an important environmental health service and an integral part of basic urban services

However, Residential households are mainly the major stakeholders interested in receiving effective and dependable waste collection service at a reasonably low price. In most urban centers of developing countries, residential areas, mostly the low income residential areas, solid waste service are unsatisfactory. Residents normally

give priority to water, waste water and electricity supply as these services are channeled through pipes.

Solid waste is generated and discarded according to public wants. These compounded the problems for the urban authorities and policy makers. Increased in generation and disposal of household solid waste became an increasing problems in urban areas due to high population density and urbanization; Household wastes are growing environmental problem in urban centers in both developed and developing countries around the world (Barr. *et al.*, 2001), as a result domestic solid waste poses a complex challenge for environmental policy (Barr, 2007) consequently, pressure to improve solid waste collection service arises as other service became available and awareness mounts regarding the environmental and health impacts of poor waste collection service. In cities of the developing world, municipalities are mostly responsible for the solid waste management at city level (Zurbrugg, 2012; Muggaga, 2006 & Cointreau, 1994). Various

actors or stakeholders participate in every solid waste management system in both the developed and the developing countries. In principle, these actors are part of every solid waste management; the municipal government NGOs/CBOs, households or service users, private formal/informal sectors and donor agencies. (Muller & Hoffman, 2001). However, in most Nigerian urban centers, municipal solid waste management is characterized by inadequate collection and improper disposal, due to the inability of the municipalities to handle the increasing quantities of solid waste generated. The uncollected waste littered the streets, roads and public drains and is an obvious cause of degradation of the environment.

Domestic solid waste management has been defined to encompass the full range of management activities for domestic waste streams from the point of generating the waste to the point of disposal (Cointreau *et al.*, 1984; Baud & Shenk, 1994 & Jones, 1995). Also (Bovea *et al.*, 2010 & Zurbrugg *et al.*, 2012, Cherian & Jacob 2012), highlighted that waste management is a complex process that requires a lot of information from various sources such as factors on waste generation and waste quantity forecast. However, these are generally unknown to government officials especially the responsible agencies

According to (Napoleon *et al.*, 2011 & Ukpong and Udopia, 2011) there is a general paucity of data on key waste variables such as generation rates, composition, densities, storage and transport. The United Nations Environment Program (UNEP, 2013), stated that in developing countries, data on waste generation and composition are largely unreliable and insufficient, seldom capturing system losses or informal activities. (chu *et al.*, 2011, UN-HABITAT, 2010). Without proper data it might be difficult to design sound strategies or to make wise budget decisions on waste management (Wilson *et al.*, 2012). Also, Cherdasatirkul (2012) stated that it is hard for government of developing nations to deal with MSWM issues because of lack of information and adequate data collection. In most Nigerian urban centers, reliable data on solid waste generation and composition is generally scarce and incomplete.

1.1 Integrated Solid Waste Management (ISWM)

The ISWM concept was established by the US environmental protection agency (EPA) in the early 1990s to expand existing solid waste management problems that aims to

avoid many of the holistic approach to tackling solid waste management problems that aims to avoid many of the failing of previous technology driven approaches (Van De Klundert and Anshutz, 2001) Instead of focusing only on the disposal of solid waste, ISWM includes preventing waste, minimizing the initial generation of materials through being sent to landfills or incineration. Tchobanoglous *et al.* (1993), Benzaid *et al.* (2011), defined ISWM as selection and application of suitable techniques, technologies and management for the programs to achieve specific waste management goals and objectives. Bagchi (2004), stated that the goal of sustainable solid waste management is the recovery of more valuable products from waste with the use of less energy and more positive environmental impact. These according to the (EPA) comprise of hierarchy of activities; source reduction, recycling, waste combustion and land filling. The hierarchy is a useful conceptual tool for goal setting and planning at the national level, states and municipalities. The concept of ISWM discussed by Van De Klundert and Anshutz recognizes three important dimensions in waste management.

The Stakeholders involved in waste management, The (Practical and Technical) element of the waste system and The Sustainability aspects of the local context that should be taken into account when assessing and planning a waste management should be appropriate to local conditions and be feasible from the technical, environmental system. The important principle of ISWM is that a waste management, social, economic, financial, institutional and political perspective (Anschutz *et al.*, 2004), ISWM differs from conventional approaches and towards waste management by seeking stakeholder participation, covering waste prevention and resource recovery, and promoting an integration of different habitat scales (city, neighborhood, household) . In most developing countries authorities' efforts are more concentrated on waste collection and transport and open dumping.

Therefore, there is the need to develop more sustainable ways and means in turning waste into resources, reducing environmental impact of waste disposal, create employment opportunities improve health and environmental qualities. The objectives of ISWM is to deal with society's waste in an environmentally and economically sustainable. ISWM can be used as an analytical tool for the analysis and assessment of the whole project cycle, especially for design, formulation, for monitoring and evaluation of a waste management project.

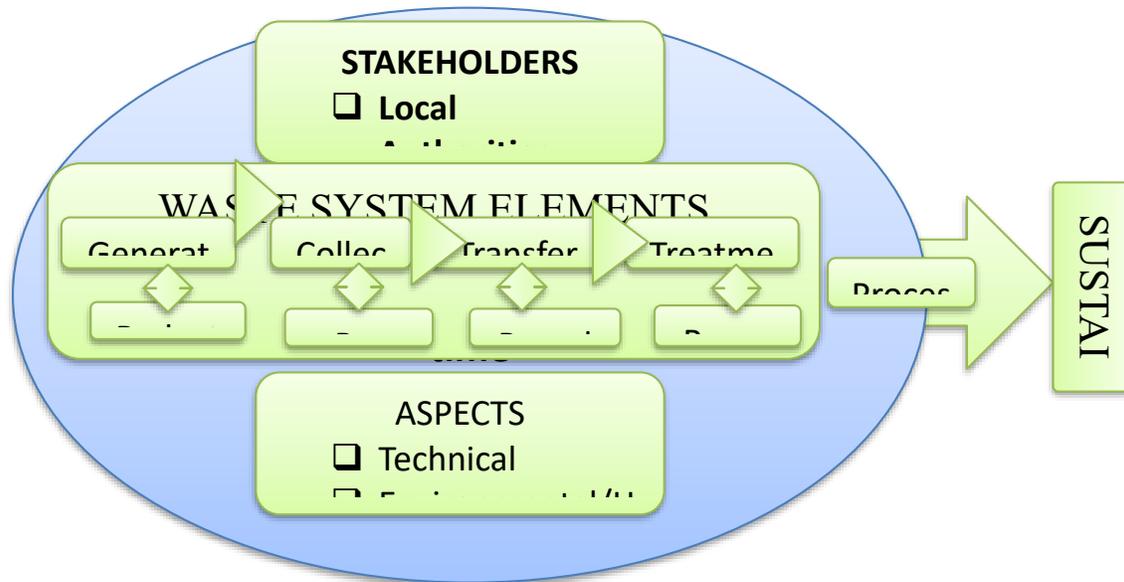


Fig 1: Integrated Sustainable Waste Management (ISWM) approach or model.

Source: Van De Klundert and Anschutz, 2005

1.2 The Modernized Mixtures Approach (MMA).

The modernized mixtures approach MMA is an integrated approach to (water and solid waste) infrastructure development, which is in particular relevant for situations of poor developed infrastructures and poor people. MMA is an approach which deviates both from the well-known western large scale high technological grid base as well as from familiar small scale, low-tech, decentralized and stand-alone technologies applied in many African communities. MMA approach refers to the development of medium and large scale environmental infrastructural systems which ‘build upon’ and are constructed from decentralized and centralized units which take into account of specific local conditions of developing countries. MMA integrates (Eco) technological, economic and social dimensions of environmental infrastructures (Spaargaren, 2005).

The approach is made up of three criteria of Accessibility, Flexibility and Sustainability. The approaches should be ecologically and institutionally sustainable, accessible (particularly for the poor), and institutionally and technically flexible, resilient and robust (Spaargaren, 2005). MMA has principles of mixed scales strategies, technological payment systems and decision making. It is referred to as “mixtures” because it takes the best features out of both (modern) decentralized and centralized systems and combs them into hybrid solutions which better fit the local situation of African cities. (Spaargaren et. al, 2005).

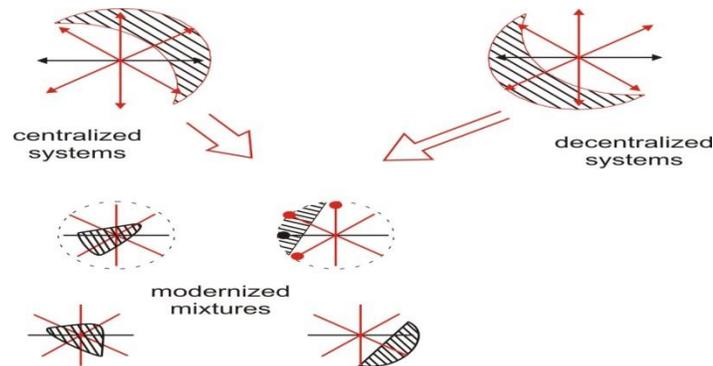


Fig 2: Modernized Mixtures Approach (MMA) (Spaargaren et al., 2005)

Source: Solomon 2011

When compared to integrated sustainable waste management (ISWM) model, the MMA is similar as it also opts for an integrated approach too, including chains, combining multiple scales in organization, management and governance, and requiring the inclusion of technical as well as social scientific knowledge. The object of the MMA is to create a ‘fit’ between different infrastructural options on the one hand and the prevailing socio-economic, ecological, technological, and political conditions on the other. The conceptual framework basically consists of four (5) main parts, viz:

- a. **The upper part:** the upper left part depicts the position of the household in the solid waste management chain
- b. **Part II:** the second part shows three basic roles of households and their functions in the solid waste management chain: Households as solid waste generators, Households as handlers of solid wastes in the primary phase of the chain and

Households as recipient of solid waste management services.

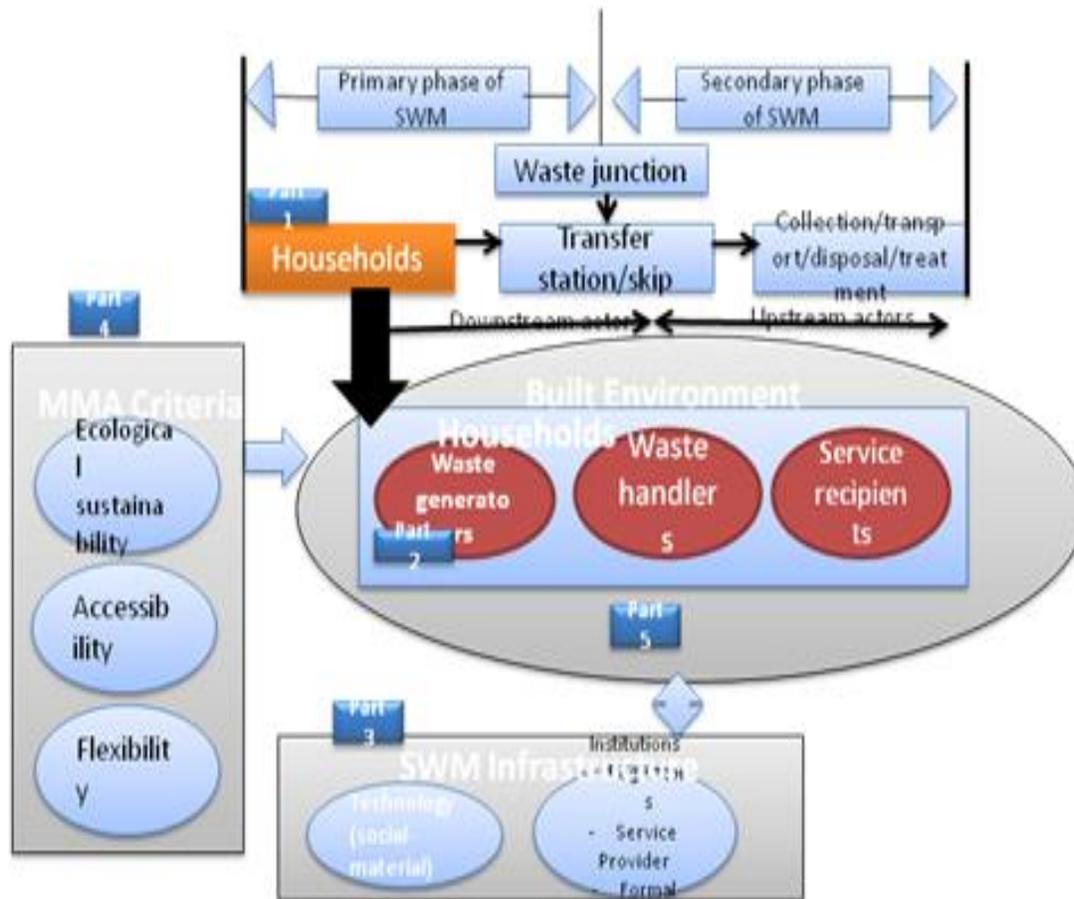


Fig 3: Conceptual framework for analyzing the role of households in SWM
Source: Solomon, 2011

- c. **Part III:** this shows the solid waste management infrastructure which includes; The (Socio) technological infrastructure- that is materials as well as social elements The institutions, which can be divided into the official service regulators and the actual service providers. The actual service provider in this context includes formal and informal stakeholders
- d. **Part IV:** this part of the framework represents the criteria relevant for the assessment of (new) socio-technical infrastructures to be developed with the used of the MMA.
- e. **Part V:** The architecture/planning of the households. The built environment in this research refers to the local factors like architecture and infrastructure are major determining factors in solid waste management. For example, dwelling with courtyards may have space for storing waste for several days, but compact housing with no space for storage may necessitate that some waste is taken outside the property as soon as it is generated.

II. METHODOLOGY

Qualitative methods used in this study include: Reconnaissance survey, semi structured interviews and, direct observations). Information was obtained from the level of federal government represented by the official of National Environmental Standard Regulation and Enforcement Agency (NESREA), from officials of Bauchi State Environmental Protection Agency (BASEPA) Bauchi State Commission for Women and Youth Development and rehabilitation and the household level. Document reviewed include but not limited to; NESREA Act, 2007, environmental impact assessment Act of 1992, national environmental (sanitation and waste control) regulations, 2009, the management of solid and hazardous wastes regulations.

Quantitative method used was the household survey questionnaire and waste characterization study. When it comes to making appropriate decision in relation to the waste management of Urban Solid Waste (USW), which include Residential Solid Waste (RSW), two factors are important; The total volume and composition. Both these factors change with time and socio economic conditions (Singh *et al.*, 2011, Cherian & Jacob, 2012). Data were collected from a total of 378 households purposely

selected within the districts of Bauchi metropolis. Characterization study was carried out to determine the per capita daily waste generation and the percentage fractions of household waste constituents. Various statistical test procedures including means, standard deviation, and frequencies, Statistic Package for Social Science (SPSS), Spearman’s correlation and regression analysis were the methods used to analyze the quantitative data from the study.

III. RESULTS AND DISCUSSION

3.1 Solid Waste Generation and Composition:

The conceptual framework used in this study for investigation of households’ solid waste management is inspired by the theory of modernized mixtures approach (MMA), an expanded version of Integrated Sustainable Solid Waste Management (ISWM) which makes it possible the study of solid waste management practices from the perspective of households and conceptual framework developed by Solomon. This study found that per capita waste generation in the selected sample varies from 0.22kg/capita/day to about 0.48kg/capita/day; while 0.30kg/capita/day was obtained for Bauchi Metropolis. Similar studies compiled by Ogwueleka (2009) and (Adewumi et al, 2005), for major Nigerian commercial and urban centers showed the value of per capita solid waste generation ranges between 0.43kg/capita/day in Ilorin, Kwara state to 0.63kg/capita/day in Lagos as shown in Table 1.

3.2 Waste Composition:

Study found that domestic wastes constitute 61% organic (biodegradable, kitchen waste). This is typical of most wastes from cities of the developing countries. Other waste percentage fractions of each constituent of wastes generated in Bauchi metropolis is: Residues = 14%, Polythene = 13%, Paper = 4.2%, Glass = 1.9%, Plastics = 2.8%, Metal = 0.9%, Textiles = 2.2%.

Table 1: Comparative values of per capita waste generation for some Nigerian Urban Centers compiled by All Sites Engineering (2009), Sridhar and Adeoye (2003), Usman (2016)

City	Kg/capita/day
Lagos	0.63
Kano	0.56
Ibadan	0.51/0.219
Kaduna	0.58
Port Harcourt	0.60
Makurdi	0.48/0.54
Onitsha	0.53
Nsukka	0.44
Abuja	0.66
Abeokuta	0.60
Ado ekiti	0.71
Akure	0.54
Ile-ife	0.46
Ilorin	0.43
Bauchi	0.30

Other studies have indicated similar results. Stanley *et al.*, (2012) 87 % organic fraction in Sabon Gari Zaria, Ogbonna & Umunakwe (2015), 67 % organic fraction in Awka; (Stanley *et al.*, 2012), 61 % organic fraction in Samaru, Zaria and (Benjamin *et al.*, 2014) 56 % organic fractions in Abuja FCT, while Agbesola (2013) obtained 55 % organic fractions for Lagos Metropolis. Nabegu (2010), obtained 47% organic fraction in Kano, Nigeria. This result can justify the linkage of waste composition and economic activities at household level.

The nature of the food waste being organic suggests the possibility of recycling through composting. Therefore the implication is that, there is the need to regularly and efficiently evacuate waste in the study area, to avoid foul smell, leachate and methane production which are detriment to the health of the inhabitants.

The information obtained from the results of this study is vital in planning solid waste management at household level. It helps in identifying material categories and their relative proportions in the household waste stream for; potential source recovery reduction composting possibilities, and recycling. Also, full knowledge of the constituents and composition of the waste stream provides information which is essential in selection of the type of container most appropriate for storage and transport, choice of a suitable disposal method and determination of the environmental impacts of the waste if improperly managed.

Another importance of waste composition studies is when modeling waste management systems; waste composition is one of the most important parameters (Damagaard, 2010).

3.3 Waste Separation, Resources Recovery/Re-use and Recycle.

The current waste management practices applied by the households in Bauchi metropolis showed that the practice of waste separation at source is very rare as only 20 % of the respondents indicate that they practiced waste segregation at source. In most Nigerian urban centers, waste sorting or separation at source is not a common practice. Odewumi (2013), reported that there is very little attempt at sorting solid waste and the aspect has not received any attention in the waste management strategy in Lagos. (Adekunle *et al.*, 2011) reported that it is not a practice to separate waste materials at source or any point during its management in Nigeria.

The result of this study showed that households retain some of the items that they do not treat as waste. It was found that recovered materials such as plastics mostly in form of empty water and oil containers amount to 75 %, while metals such as empty milk and beverage containers amounted to 13 % and bottles 3 %. These materials or recyclables which are not treated as waste 32 % of the respondents indicates that they re-use these recyclables, 43 % give them to others as who might need it. But 12 % sell their own to waste vendors and 13 % mixed them with other wastes. the implications of the few percentage of the respondents that practiced waste sorting at source by obtaining recyclables exhibits the phenomenon of resource recovery in waste management.

3.4 Perceptions and Evaluation of Solid Waste Service Recipients in the Study Area

Households perceptions with regard to the need for transfer station or communal bin in their neighborhood is an important

factor in assessment of household solid waste service delivery as it integrates the downstream actors (Households) and the upstream actors (formal and informal stakeholders in providing solid waste services) Stationary wheel-containers (roro), masonry bins (designated dumping site), open space (open dumps) public drains and road junctions served as transfer stations in the study area. 64.5 % of the respondents indicated that they knew the importance of the communal bin in their neighbourhood in effective solid waste management and are willing to have it despite all other negative attributes associated with it, like bad odour and health implications.

While 17.5 % indicated that communal bin or transfer stations produced unpleasant smells and for that reason are not to be welcomed in their neighborhood. With regard to these opinion, similar observations was made by Odewumi (2013), where he reported that "Aatan" or transfer stations are not welcome by some residence due to the popular belief that it is the food basket of pets, like chicken, dogs, pigs and so on. The implication of households perceptions towards the location of the transfer station is that, their perceptions and opinions should influence the decision making process about the location of transfer station. Essentially the decision on the location of transfer station should take in to consideration the extent of resistance by households against the location of the transfer station in their neighborhood in addition to

the factors such as health impact and accessibility (Solomon 2011).

Achieving sustainable development goals with respect to SWM in urban areas required a strategy built on the flow of urban waste (solid waste management chain) based on accurate and reliable information on the waste and its generators, (the households) and which identifies specific urban setting. The strategy should enhance waste management from the technological, socio-economic and environmental perspectives

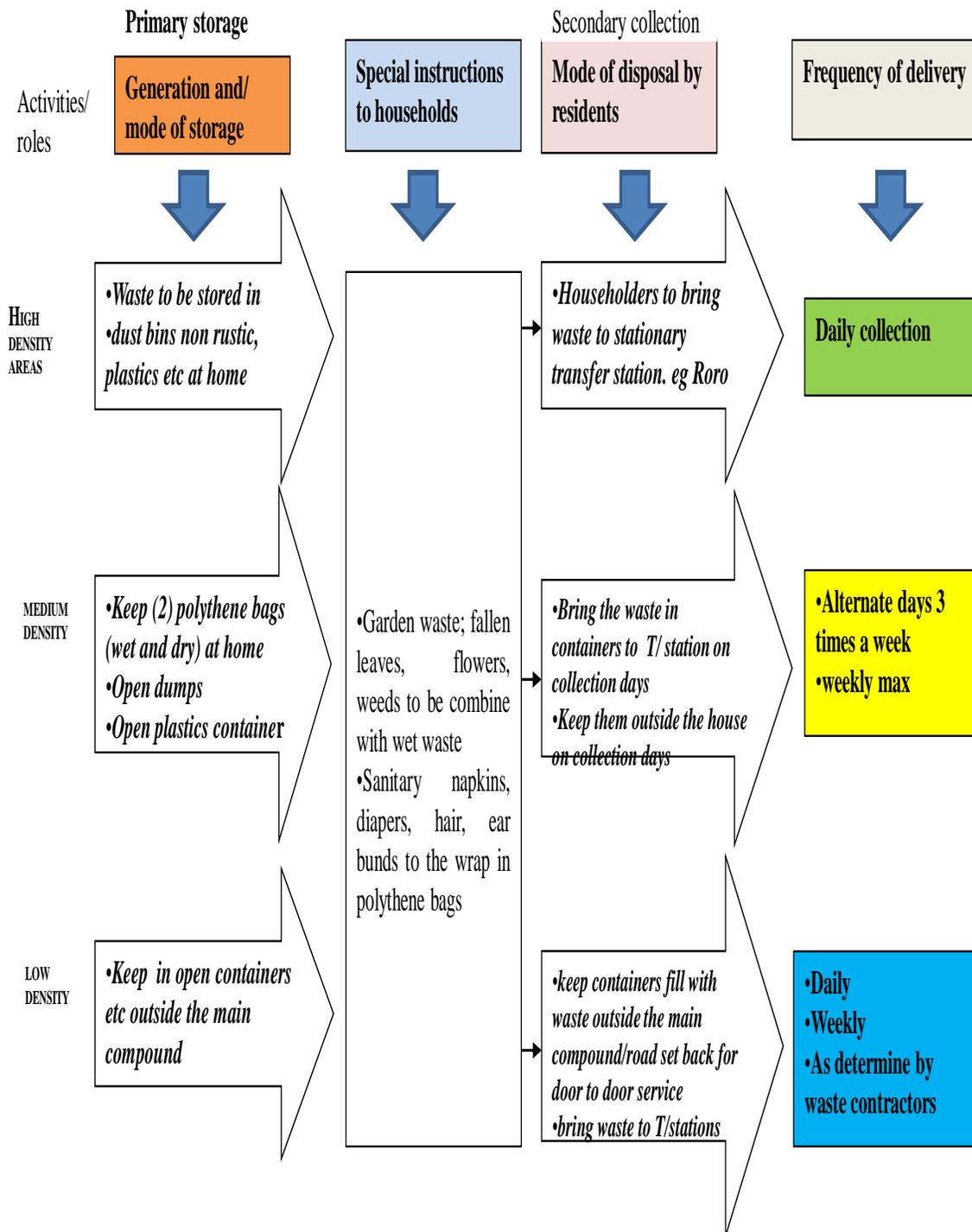
3.5 Domestic Solid Waste Management Strategy Principles

As shown in the diagrams below:

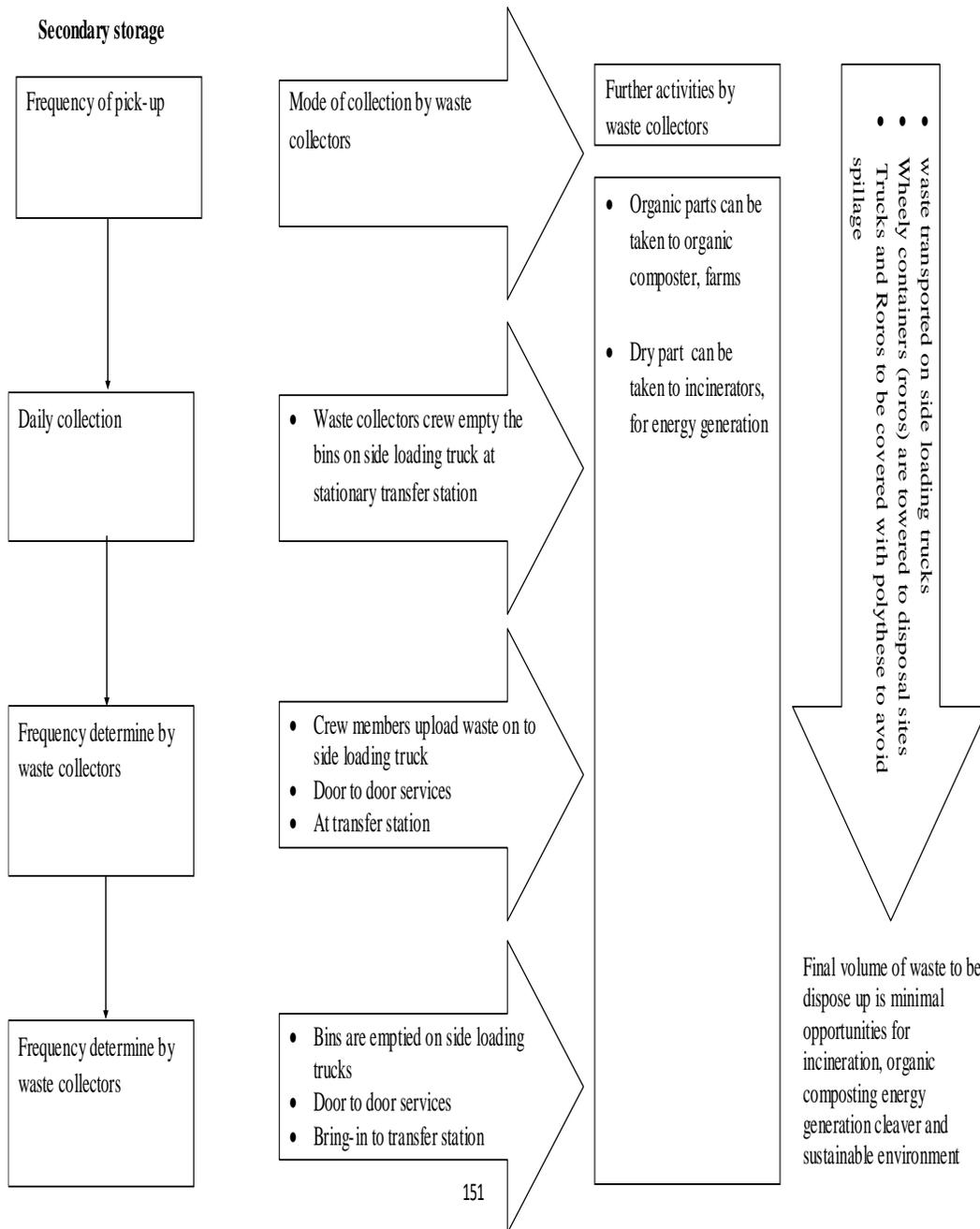
- **Strategy Objectives;** Accessibility; flexibility; and sustainability of household solid waste management
- **Scope;** public participation, private sector, disposal facility siting, planning
- **Actors;** households, municipal agency, private contractors, ward leaders, NGO, CBO.
- **Technical Aspects;** no use of compactor trucks, movable and stationary transfer stations, use of side loading trucks, waste separation at source

DOMESTIC SOLID WASTE MANAGEMENT STRATEGY TEMPLATE

HOUSEHOLDERS ACTIVITIES



ACTIVITIES OF FORMAL WASTE STAKEHOLDERS (BASEPA AND OTHER CONTRACTORS)



IV. CONCLUSION

Solid waste management in Nigerian urban centres was found to be what can be termed as "movement of the waste from one location to another". It is devoid of sustainable practices of reduce, reuse and recycle (3Rs) from generation, handling up to final disposal. From the studies, the average per capita waste generation for Nigerian urban centers stands at 0.54 kg/cap/day.

According to the World Bank development indices report of 2016 the country's urban population was 90,385,385. The implications of this outcome indicates that the daily waste generation in Nigerian Urban areas amounts to 48,808,107.9 kg (53,801.8 tons) which needs to be treated and dispose up in an environmentally and sustainable manner.

This information is vital to policy makers, architects, engineers, city planners and environmentalist as world cities faces enormous environmental challenges in terms of climate change,

resource use and protection of the natural environment. UN SDGs. Improvements in SWM and 3Rs will substantially contribute to the better living conditions and better health of more than 2–3 billion people who currently lack services, prevent plastics entering the oceans, significantly contribute to climate change mitigation, and help restore terrestrial ecosystems. In the process, decent jobs will be created, which will support many people and their families on their way out of poverty (Rodic and Wilson 2017).

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Plath Children – Her Treasured Creations like her poems

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ABSTRACT:

The title of the paper is “Plath Children- Her Treasured Creation like her poems”. The main intension of the paper is Plath insecurity with regard to the future of her children. It reveals the apprehension, anxiety and uncertainty that Sylvia goes through when it comes to the care of her children. The kind of fondness and minuteness that she has for her poems can also be traced in the upbringing of her children.

KEYWORDS: Children, love, hate, agony, fear

INTRODUCTION:

Motherhood has its artistic tradition in prose and a subject very quickly vulgarized in poetry. It has been always rated a subject for second rate female poet. To write on a subject like this not only one needs accomplishment but also a novelty worth examining. A study of Plath’s poem along with comparison with poetry of Sarojini Naidu on children and on motherhood provide a more approximate judgment of Plath poetic concerns and it also provides an insight into a relatively unexplored area of female psychology.

Treasured Creation- Plath’s Children

“Sitting on her father’s lap in the den---- with her father’s strong arm around her --- she thought she could face the doomsday of the world in perfect safety”

Behind the facade of independent, resolute and efficient smart girl, there still was that helpless girl of nine who had lost her father and was facing the brutal world without guidance. Denied of the father love, Sylvia didn’t want her children to suffer from the same therefore one of the most common theme throughout her writing career was the desire to become a mother. Sylvia was perceived between literary and biological creativities, marrying and having many children was part of her plan for a life of complete fulfillment:

“I will write until I begin to speak of my deep self, and then have children and speak still deeper. The life of the creative minds first then the creative body. For the latter is nothing to me without the first and the first thrives on the rich earth roots of latter”.¹

Plath’s desires to bring her own life cycle to full complete fruition in motherhood is also strongly evinced from the time of her earlier work, only growing more securely rooted as her writing progressed along with maturation. Katha Pollitt writes:

“ the feminists, too, will have to come to terms with the tenderness and purity of Plath’s maternal feelings, as displayed in ‘Brasilia’, ‘Child’, ‘For a fatherless son’ and her radio verse play Three women’

“A Note of Triumph [The collected poems]²

These poems depict first a woman at times almost desperate to have a child, and than a doting, reverent mother. Although certainly the power to create a brand new human being is far and away the highest earth-bound potential. A woman has housewife Dom and forgoing of all work accepts for the loving raising of one’s children goes against the feminist establishment credo that not only women should not have to stay at home, but in fact they should not do so at all, for their own good. Sylvia Plath’s values were just the opposite of these; a year of teaching convinced her that the professional world would only detract from her personal priorities, and thereafter stayed at home, creating her babies and the best poems of her life.

Plath’s realization of her lifelong fearful yet awed and enthralled desire for children made her complete in a way apart from the biological or the domestic as well. After giving birth first to a baby girl names Freida Rebecca Hughes and then a boy names Nicholas Farrar Hughes she was a changed person enjoying herself amidst all this hustle bustle that life actually meant to her as her protagonist Esther Greenwood says in her novel ‘The Bell Jar, “I wanted change and excitement and to shoot off in all direction myself like the coloured arrows from a fourth of July rocket”.³

After her split with her husband Sylvia Plath did not vengefully shake off the trappings of domestic life and reinvent herself as a new and different women, nor did she sink into herself and become an over harried mother with no time and no energy for her art. She found the balance between the responsibilities of single motherhood and the demands and desires of her art: the poet began to write between four and eight a.m., before her babies had awakened for the day. The poems of this period are the one universally hailed as the strongest, the deepest, the

¹ Dorothea Krook, “Recollections of Sylvia Plath”, Sylvia Plath: The Woman and the work p. 55

² Pollite Katha “A Note of Truimph [The Collected Poems] Critical Essays on Sylvia Plath. Ed. Linda W. Wagner Boston : G.K. Hall and Company, 1984 p. 67-72

³ Sylvia Plath “The Bell Jar” London : William Heinemann, 1963 (published under the pseudonym “Victoria Lucas”) p. 188

most profoundly of all her work and she began to churn them out with astonishing speed. And still, the domestic thread remained. Moreover she was dedicated to her poetry more than ever. Plath wrote more poems about motherhood than about any single subject. No women poet or writer can go straight forward without paying any heed on the subject to children.

Plath continued to write poems about children exploring specific domestic details or actual habits of her own children; she mainly focuses on the special relationship based on the Mother –Child theme. Her motherly concern for the newborn’s safety is amazing, as she is conscious that her child is laying bare a simple, innocent being to get hurt, spoiled and corrupted by the offensive critics of the world.

In her last days, she grows fonder of her two babies and her baby poems in her empty sea of existence. The poems written for her children, besides being records of her more positive and calmer moments are also documents refuting the charges of total nihilism of her poetry. All her poems based on babies tell the most –heart rendering tales of a helpless mother who knows that she had to give them up even before, the mature. Being the most pure and innocent creatures the children never ceases of getting her admirations.

The most important things for Plath were always those created: her poems, her children. Even in the aftermath of a disintegrated marriage, which must have been for her the terrible crushing of a long cherished dream, she retained the determination to be not only the great poet she’d so long dreamed of becoming, but also a responsible mother beyond reproach. Perhaps it is in the witness of the struggle to do both and to do both well that feminists, women in search of their sole identities and in search of a liberated independence.

“Brasilia” a poem which Sylvia Plath wrote for her daughter Freida Hughes deals with Sylvia’s concern about her daughter survival in the harsh world. The world outside her lap would really break all her desires which are yet to be developed as expressed in the following lines:

“And my baby a nail

Driven in, driven in”

Brasilia⁴

The world would not let her live as she is a fatherless child. Every one would have a starring eye on her. People wearing the mast of gentleman may cease her and ruin her entire life which would take away her glory. Sylvia Plath poems depict the harsh realities which would be faced her children whereas Sarojini Cradle song too conveys the same mother’s concern for the future of her children. But her poem do not depict harsh realities but a hope of making the future of the child bright. Hence, she seeks blessings from the moon and states:

⁴ Sylvia Plath “ Winter Trees” Brasilia, Harper and Raw Publisher, New York 1972 , p.11

Mother Moon, bless baby,
Let him live a hundred thousand years,
Moon; give him milk and basi,
Let it come swaying this way,
Let it come swaying this way,
And straight into baby's mouth"

"Lullabies and Cradle Songs"⁵

Unlike Sylvia Plath, Sarojini is not afraid of putting her child to the outside world but symbolizes the harmony and beauty the mother wishes for her child, from nature and life. Her imaginative experience extends to the saints from whom she seeks blessing and protection as her child would face in future and to bring harmony in the life of a child without any hurdle.

Sylvia Plath poem titled "Child" is of twelve lines, written in terza rima, consisting of a sentence only and conveys the hurry she is in to finish her duties to the child and her longing to fill the life of her babies with conceivable joy as expressed in the following line:

"Whose names you mediate"

"Child"⁶

Her tenderness follows out generously, cleansing all the fearful, hateful and dismally negative emotions of a person of a high intellectual order. The eternal mother speaks out sharing the common concern of all not –so-extra ordinary mothers all over the globe.

"Your clear eye is the one absolutely beautiful thing"

"Child"⁷

Her poetry becomes more and more the search for this "absolutely beautiful" in her last days. As a result, her poetry becomes more searching in pace, more sincere in tone, more desperate in voice to come to terms with the disturbing factors that life presented to her. Plath the mother and Plath the poet are so equipoise that it becomes difficult to serve the two in perfect brackets.

Unlike Plath, Sarojini's poems reveal with a profound depth and meaning a truly Indian mother, who rocks the cradle while putting her child to sleep in her "Cradle Song" with a tender warmth she sings sweet wallaby and remarks:

⁵ Hem Berua, "Lullabies and Cradle Songs", Folk songs of India, New Delhi, 1963. Ch.4, p.55

⁶ Sylvia Plath "Winter Trees", Child, Harper and Raw Publishers, New York, 1972, p.18

⁷ Sylvia Plath "Winter Trees", Child, Harper and Raw Publishers, New York, 1972, p.18

Dear eyes, good night,
In golden light
The stars around you gleam:
On you I press
With soft caress
A little lovely dream”

“Cradle Song”⁸

Sarojini captures the maternal sentiments in this cradle song, set amidst in this cradle song, set amidst the harmony and beauty, peace and response in nature’s bower of bliss. Her aesthetic experience enriches the lovely dreams with a sweet spontaneity of mother’s concern for the child. Even Sylvia’s trouble disappear when she milks her babies, which is so every well expressed here:

This is the fluid, in which we meet each other,
This haloev radiance that seems to breath”

“By Candle Light”⁹

The poems “By candle light” speaks of an apprehensive tenderness of voice haloes when she floats in the milk of her filial kindness. Her babies, her only source of happiness in this miserably despondent life which she got as a legacy from her husband “who was a source of love and hate to her”.

Likewise Sarojini’s “To My Fairy Fancies” depict now the aesthetic perceptions embellish her thought and attempts to communicate the human experience in new veins of imagery. Therefore, she bids good bye to her fancies and voices with a certain maturity her own realization in a multitude of images:

Nay, no longer I may hold you,
In my spirits soft caresses
Fair fancies, fly away
To the white cloud-widerness,
Fly away
Nay, no longer ye may Unger
With you laughter lighted faces,
Now I am a thought worn singer,

⁸ Sarojini Naidu, “Cradle Song”, *The Sceptred Flute* p. 17

⁹ Sylvia Plath “Winter Trees” By Candle Light Harper and Raw Publisher, New York, 1972 p.29

In life's high and lonely places

Fairly Fancies, Fly away

“To My Fair Fancies”¹⁰

Here the multitude of images expose the so more introspective facet of Sarojini's personality. It is over here that the girlish ecstasy has passed and that a graver music has taken its place. These revelations shadow the dazzling emotional imagery of the 'lyric child' with a realization of lives deeper problems. In other words, a design and a purpose in the cosmic process of existence.

Contrary to Sarojini Naidu world is the world of Sylvia Plath where she knows very well the condition of a fatherless child in this hostile world and when the same things happened to her own darlings. She could not hold back the bitterness the helplessness, the hatred that destroyed her by burning her whole being which found an expression in the poem “For a Fatherless son”

Even critics have found this poem as one of the cruelest poem indeed, where she has projected the cruelty of the outer world to her own child:

“One day you may touch what's wrong
The small skills, the smashed blue hills, the
God-awful hush
Till then you smiles are found money”
“For a Fatherless Son”.¹¹

As the ways of the world poison the innocent tootles smile, the child grows up to throw open the cupboard of hidden skeleton touching live wire accidentally or knowingly. Even her earlier poem like “Magic”, “You're”, “Morning Song”, “Candles” to name a few deals with the theme of motherhood and reveal her concern for the innocent babies.

Unlike Plath Sarojini's “The Lonely Child” portrays the emotional overtones which deepens the quest and the child in the poem cries out in despair.

Birds and bees
And flowers have one another
The lambkin and the lark
The grey mouse and the squirrel and the deer----

¹⁰ Sarojini Naidu, “To My Fair Fancies”, *The Sceptred Flute*, p.26

¹¹ Sylvia Plath “Winter Trees” *For a Fatherless Son*, Harper and Row publisher, New York, 1972 p. 33

Does God forget
How much I want a mother
To hold me in the dark
And whisper lovely secrets in my ear?"

“The Lonely Child”¹²

The visual image of the lonely child reflects the predominant passion of ecstasy and pain. Hence they release into the reader a special poetic emotion, which is awakened by pathos. This sensuous picture is to some degree metaphorical, for it conveys an under note of some human emotion in the context which the poetess intends to communicate in visual pattern.

Except for this poem, all other poems of Sarojini’s are emotionally charged and convey the hope of a radiant future for her babies as against the harsh world of Sylvia Plath where she is little hesitant of putting her babies to the outside world. Sarojini’s little child evokes her fairy fancies into the realms of the unknown. She primarily responds to a world of golden thresholds and softly embraces the dream world of her infant soul.

In most of the poems dedicated to children in Sylvia Plath and Sarojini Naidu poetry, they are (children) sleeping or just waking. He/she never does anything. They are as if a “Clean State” also totally passive, receptive and vulnerable. Most infants are of course most often sleeping: but the predominance of the sleeping child in Plath’s as well as Naidu’s poem as interesting as a continuation of concerns evident in the poems about their own childhood. While Sylvia Plath earlier poems about her mother were particularly resentful about the victimization of the child, Sarojini Naidu poetry emerges as a figure of purity, radiance and zest, amidst the dream world of fairy fancies and childish ecstasies. Sylvia Plath later poems about her own children underscore the fact that all children are victims. She does not minimize her fears that as a mother, she too will be a victimizer. Her child will inherit hours of blackness from her. But she more often sees the child as the victim of the world’s evil and blackness.

Sarojini Naidu on the other conveys her imagination, her frolics of fancy and strength of prime, with a purity, radiance and zest of life. It is through these multitudes of images she unconsciously gives herself away. Her images though conventional, are most rooted in her own personal experience and hence they expose their own identity and a certain maturity in design.

On the whole, Sylvia Plath poems on motherhood lies in their exploration of a relatively uncharted area of experience. The cluster of maternal feelings surrounding the birth of a child has never been adequately described

¹² Sarojini Naidu

and traditional attitudes do not serve. The view of the woman as a vessel through which the man provides himself with heirs is everywhere denied in the creative act. The passive, dependent wife is at the opposite extreme from the active, life giving mother caretaker of hearth and the mother who is often care ridden by the very great dangers from which her child will not be sheltered by his father. Plath writes with an awareness of her own inadequacies as a mother and a sense of the difficulties of nurturing another human being, but she is also aware of the inadequacies of the world. She talks here as a creator in an increasingly destructive world and her fears are the well founded fears of all mothers. Her poems on motherhood opens up the subject for serious consideration. If she limits herself on private and taboo areas, she is also concerned with universal questions about creation and nurturing.

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Sentiment Analysis of Scientific Citations between Lexical Methods and Statistical Methods

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Abstract- The exponential growth of available scientific articles provides researchers with many new challenges and opportunities. Researchers usually analyse divers' scientific papers to find those pertinent to their research. Citation sentiment analysis is an important task as it can help researchers in identifying shortcomings and detecting problems in a particular approach, determining the quality of a paper for classifying citations that it is positive, negative or neutral in the weighting scheme and recognizing problems that have not been addressed as well as possible gaps in current research approaches. In this paper we present a hybrid approach related to the sentiments analysis generally and citation sentiments analysis specifically; Lexicon-based approaches and Corpus-based approaches (Machine learning and Deep learning). Then, a brief survey study is presented about the use of each approach. Finally a comparison of the used techniques and the ones based on machine learning.

Index Terms- Scientific Citation, Sentiment Analysis, Lexical Methods, Machine Learning, Deep Learning, Word2Vec

I. INTRODUCTION

When a scientist produced a writing (article, book, communication to a congress, or other type of document), he must refer to previously published work, because it is an indispensable practice for him. According to [1], each scientific text in a given subject does not exist in itself; it must be included in the literature of this subject.

In a scientific text, the expression used to cite another work is called 'a citation', and the link that indicates the identifier of the cited work is known as 'a reference' [2]. To avoid confusion between these two terms -citation and reference are often used interchangeably-, researchers propose to give definitions to both of them:

Citation : is a call of a reference in a scientific document, it establishes a link with the reference for a defined subject, it is written in a unified way in the text. It is the recognition that a document receives from another [3].

Reference : is the unique identifier of documents at all ranking levels in an act of conference, a book, etc. it is the discrimination that one document gives to another [3].

Citations analysis is an element of bibliometric [4] his goal is : analyze globally using statistical and mathematical methods, the components of a documentary corpus to identify the relationships between them. It is an analytical tool that uses citations references from scientific documents, and it is a method of determining the use value of a document, and interpreting the information contained in the citations [5]. It is also a method for obtaining the mechanisms of diffusion and reception of scientific innovations.

To identify the semantic relationship between one document and another, researchers used Sentiment Analysis techniques, which is the task of identifying positive and negative opinions, sentiments, emotions and attitudes expressed in text. Although there has been in the past few years an increasing interest in this field for different text genres such as newspaper text, reviews and narrative text, relatively less emphasis has been placed on extraction of opinions from scientific literature, more specifically, citations.

Citation sentiment detection is an interesting task [6] as it can help researchers in identifying weakness, and detecting problems in a particular approach, determining the quality of a paper, for ranking in citation indexes by including negative citations in the weighting scheme, and recognizing issues that have not been addressed as well as possible gaps in current research approaches. This step comes after another more interesting; it is extracting the citation context.

The extraction of the citations context i.e. where the citations is either in a sentence, or for more precision within a paragraph (it might be interesting to add a few sentences before and after); for example, we can take phrases from the sentence containing the citation to the sentence containing the following citation, or to the end of the paragraph. It is a fundamental step in several applications such as citation summarization, survey generation and citation sentiment analysis.

The purpose of this paper is to present a state of the art of different approaches of sentiment analysis, and its applications in the field of citation analysis

This paper is organized as follows: (Section 2) gives a state of the art of research works that uses sentiment analysis, then the approaches focused on citation sentiment analysis in (Section 3), subsequently (Section 4) present a discussion result of our study, and finally a conclusion (Section 5).

II. SENTIMENT ANALYSIS APPROACHES

Sentiment analysis or sentiment mining also called polarity mining, opinion mining aims at the analysis of text based on the direction, that is to say a text containing opinions and emotions. The analysis of feelings has generated a great deal of research interest, especially in recent years.

In the literature, sentiment analysis approaches are classified into two categories: Lexicon-based approaches and Corpus-based approaches.

A. Lexical Methods (Lexicon-based Approaches)

These approaches consist of using an external lexicon and dictionaries to extract the sentiment polarity. According to our knowledge, there are some principal work: SentiWordNet with two versions, SentiStrength, The Semantic Orientation CALculator, a holistic approach¹ and Serendio approach². In the follows we will present the first three one.

SentiWordNet is based on WordNet [7][8] which is a lexical database developed by linguists from the cognitive science laboratory at Princeton University for about twenty years. Its purpose is to catalog, classify, and relate in various ways the semantic and lexical content of the English language. WordNet is based on elements called Synsets, which are a set of synonyms and pointers connecting it to other synsets. [9][10] have used SentiWordNet 1.0 and 3.0 respectively which is a lexical resource in which each WordNet synset is associated with three numerical scores Obj (s), Pos (s) and Neg (s), describing how Objective, Positive, and Negative the terms contained in the synset are (Fig. 1).

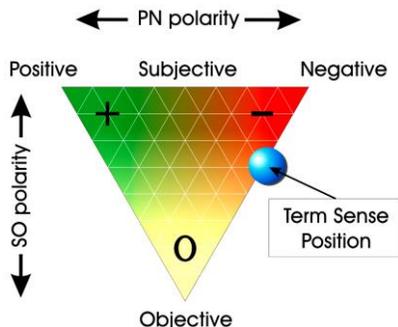


Fig. 1. The graphical representation adopted by SentiWordNet for representing the opinion-related properties of a term sense

A. Esuli and F. Sebastiani [9] based on the quantitative analysis of glosses associated with synsets, and on the use of the resulting vector term representations for semi-supervised synset classification. The three scores are derived by combining the results produced by a panel of eight ternary classifiers, all characterized by similar levels of precision but different classification behaviors. As shown in (Fig.2) the term terrible is provided with two different sentiment associations. In this case, SentiWordNet needs to be coupled with a Word

Sense Disambiguation (WSD) algorithm to identify the most promising meaning.

Regarding to [10], authors focused on improving the SentiWordNet 3.0 algorithm used to automatically annotate WordNet, they reported the results of the evaluation of SentiWordNet 3.0, against a manually annotated WordNet 3.0 fragment for positivity, negativity and neutrality, and they reported in accuracy improvements of about 20% over SentiWordNet 1.0.

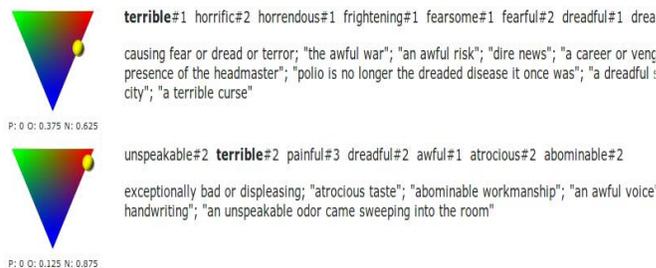


Fig. 1. An example of sentiment association in SentiWordNet

In [11] the authors are using the available Telugu SentiWordNet to perform sentiment analysis for Telugu e-Newspapers sentences. The proposed system for sentiment analysis has attained an accuracy of 74% for subjectivity classification, and 81% for sentiment classification in the domain of news data.

Other researchers proposes another algorithm SentiStrength [12], which employs several novel methods, to simultaneously extract positive and negative sentiment strength from short informal electronic text. SentiStrength uses a dictionary of sentiment words with associated strength measures, and exploits a range of recognized non-standard spellings, and other common textual methods of expressing sentiment.

Other approach called “The Semantic Orientation CALculator (SO-CAL)” [13] uses dictionaries of words annotated with their semantic orientation (polarity and strength), and incorporates intensification and negation. SO-CAL is applied to the polarity classification task, the process of assigning a positive or negative label to a text that captures the text’s opinion towards its main subject matter.

B. Statistical Methods (Corpus-based Approaches)

Unlike the first approach, the second one doesn’t use external lexical resources, but it acquires the necessary information to define sentiment from a large corpus. This information is obtained by the application of statistical language models on this corpus.

Sentiment classifiers typically use machine learning [14][15] to identify linguistic features associated with positive and negative sentiments. Such features may include subsets of words, parts of speech [16], n-grams [17][18] (i.e. Successives words), or other lexico-syntactic patterns that signal a polarity positive and negative opinions. These features may be used to train naive Bayes classifiers, which can give probabilistic assignments of positive and negative sentiment to sections of text.

¹ <https://www.cs.uic.edu/~liub/FBS/opinion-mining-final-WSDM.pdf>
² <http://www.aclweb.org/anthology/S13-2091>

In [19] authors are proposed new approach of sentiment classification (Lifelong Learning), it adopts a Bayesian probabilities optimization framework based on stochastic gradient descent. Their experimental results using 20 diverse product review domains demonstrate the effectiveness of the method. They believe that lifelong learning is a promising direction for building better classifier.

Recently, deep learning methods became a popular solution to address sentiment analysis tasks. [20] Studied current works on deep learning for sentiment analysis and grouping deep learning models into recursive, non-recursive, and the mixture of both models. The authors moreover equaled the document level and sentence level sentiment analysis on two datasets. They deduce that deep learning models can be a better solution for polarity detection.

[21] Proposed supervised learning model based on Long Short-Term Memory (LSTM) algorithm. In this model, a sentence representation was made by catching the link between each target word and its contexts. They reported that incorporating target information improves the classification accuracy of the proposed model.

Other researcher they suggested use of deep convolutional neural network (CNN) to extract features from multimodal content and feed these features to a multiple kernel learning classifier for sentiment detection [22]. Their method allow to achieve good results using different datasets.

Regarding to [23] they proposed a hybrid approach that utilizes CNN to learn embedded features and then used a multi-objective genetic algorithm based optimization technique to generate the sentiment augmented optimized vector. They trained Support vector machine (SVM) with non-linear kernel for sentiment detection.

Moreover, the mixture of multiple deep learning algorithms could be useful for improving the performance of sentiment analysis models. [24] Proposed deep learning model by combining CNN with LSTM methods and used word embedding to represent the review sentences. In this model, they used LSTM as pooling layer to capture long term dependencies, which is one of the limitations of CNN algorithm. They evaluated their model using (IMDB) Database and Stanford's sentiment Treebank datasets. The proposed model solved the polarity detection task and mitigate the word order problem. In the same way, [25] combined CNN and LSTM to solve the task of aspect-level sentiment analysis for news articles. This combination is useful when it requires capturing the semantic of the words and the association between them. CITATION SENTIMENT ANALYSIS

In the case of quote, sentiment analysis may be useful in classifying references on a positive-negative scale based on the contexts in which those references occur. General polarities for citations could also be computed by averaging the polarity values of the citation context(s) in which the source is cited. Also, positivity and negativity are sufficient

for representing broad patterns of agreement and disagreement among scholars.

Most researchers have used different techniques and tools to extract citation context [26] in a more developed way. For instance, Council IG et al. [27] have developed ParsCit, which is an open-source software tool for extracting citation context from research papers. This tool utilized conditional random field technique, as a trained machine learning model to annotate the extracted tokens in the references' string, and then identifying and retrieving citation sentences. [28] They have used this tool to parse the entire papers and then extract citation sentences, and other metadata to estimate the importance of each citation.

In [29] authors used SentiWordNet to identify the citation sentiment with the goal of calculating article quality. They extracted all sentences as citation context and they applied part of speech (POS) tags to identify adjectives. They used the SentiWordNet Lexical Analyzer to score each adjective as positive or negative. Lastly, all adjective scores are aggregated to obtain overall sentiment of the sentences.

In [30] the authors are interpreted a sentiment "positive" as an association between the citing author(s) and cited author(s), and a sentiment "negative" as a disassociation between the citing author(s) and the cited author(s). Thus, positive reference contexts may support an author's argument, signal approval of others' work, construct methodology, paytribute, and the like. Negative contexts may function to dispute claims, signal points of disagreement in the domain, correct others' work, and the like. Framing positive and negative polarities in terms of association and disassociation also provides an intuitive mapping from citation contexts to network graphs, which position nodes in relation to each other according to the connections they share (e.g. citing and being cited).

In citation network (Fig. 3), author A who cites author B negatively would still be connected to A, only more distantly than author C who is cited positively by A. If A does not cite D; A would have no connection to author D. The classifier developed in [30], would thus add nuance and sophistication to citation networks, in addition to allowing statistical analysis of various corpora and the citations they contain.

Other approach [31] proposed to detect author's sentiment in the biomedical text documents. This approach based on two steps: (1) classifying the papers as citing or cited papers, and (2) extracting citation sentences from the body of a research citing paper. The researchers applied SVM with kernel function to identify the citation polarity with n-grams as a feature set. SVM with kernel was evaluated on 414 biomedical journals' titles. They classified author's sentiment as positive or others and their model performance was 0.90.

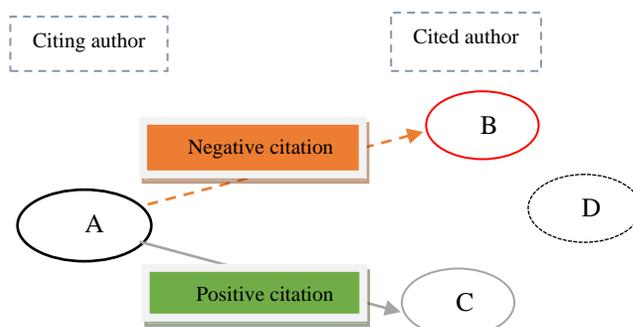


Fig. 2. Example of citation network

In [32], the researchers concentrated on the discussion section of 285 clinical trial papers and developed a rule-based method to extract citation. Furthermore, more than 4000 citations were manually annotated by three annotators. Then, they used SVM with n-grams and sentiment lexicon as a feature set to classify the citation sentences into a positive or negative citation. The combination of their features achieved a better Micro F-score than individual features. Their work developed a good method for citation annotation but the annotation process is conducted manually.

In recent times, Hernandez-Alvarez M and Gomez S JM [33] established annotation methodology for labeling citation sentences to be positive, negative or neutral in order to tackle the citation polarity classification. The authors manually built a corpus and then utilized SVM for citation classification. They tested SVM on labeled corpus and achieved F1 of 0.92.

Finally, Ma et al. [34] they remediated the polarity classification problem by exploiting an author's reputation information. They proposed to use different features, which include author id, affiliation id, polarity distribution, p-index, and unigram. They notified best classification performance through the combination of author id, affiliation id, and p-index feature. Their work was the first survey to improve the traditional citation analysis method for evaluate the quality of scientific research. They shed light on improving H-index method by including negative polarity in the calculation process. However, their work still needs feature engineering skills to use best features for citation sentiment detection.

The majority of studies for solving citation sentiment analysis issues have used supervised machine learning approaches [35][36][37]. However, these approaches have some difficulties; feature selection process is one of the most important problems that have been used to train the classifiers.

The performance of the classifier depends on the correct selection of the features, on the other hand, there is a difficulty to annotate citation automatically by reason of its special characteristics. Therefore, unsupervised approaches seem to be useful to address some of citation sentiment analysis challenges. For example, distribution representation methods such as word2vec [38][39], and dependency-based word embedding [40], can handle the manual feature extraction in the previous citation sentiment analysis literature. These methods can capture syntactic and semantic structure of citation context.

Although work in this specific area has increased in recent years, there are still open problems that have not been solved, and they need to be investigated. There are not enough open corpus that can be worked in shared form by researchers, there is not a common work frame to facilitate achieving results that are comparable with each other; in order to reach conclusions about the efficiency of different techniques. In this field it is necessary to develop conditions that allow, and motivate collaborative work.

CONCLUSION

Sentiment can be classified using various categorization schemes and can be expressed at multiple levels of granularity of text. The most popular approach for building a sentiment classifier is using supervised methods in a machine learning framework. However, supervised methods require the availability of labelled data. Labelling this data is a time consuming effort and calls for human annotators, who need to examine and label each data instance. Researchers have thus also explored the use of unsupervised methods for classification of sentiment in different text genres. Most of these unsupervised methods rely on a sentiment lexicon to assign a sentiment score to the text. The sentiment lexicons are largely dependent on the genre of the text being classified. Using the same general purpose lexicon for sentiment analysis in different domains of text is a hard problem. Because there is a marked difference between genres with respect to sentiment detection, most methods are tailored to one particular text type.

Under these variation of techniques that solved the problems of citation analysis, machine learning techniques have been used more than other techniques despite its difficulties.

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A Fast Filling Station for a Compressed-Air Vehicle used for Zero Emission City Delivery and Personal Transportation

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Abstract- A vehicle powered by compressed air is developed, in the context of zero emissions and short distance delivery in a city. The compressed air powering system is composed of a filling station, a transfer line to the vehicle, the vehicle side reservoir and the compressed air propulsion system.

In order to reach a very short filling time of the vehicle, the local filling station is composed of a high-performance isothermal compression system, and a local buffer reservoir. During fast filling, the buffer reservoir is connected to the vehicle, followed by a fast transfer, very similar to the filling of diving bottles. However, the fast transfer results into a heated air in the car reservoir, which is bound with losses while cooling down, and has the consequence of a reduced mass of air in the vehicle reservoir. An innovative air recirculation method is analysed, allowing, after the pressures having equalized, to exchange the heated air by cold one coming from the local buffer reservoir by recirculation. The result is a higher degree of filling of the vehicle reservoir, and also a higher energy efficiency of the system. The paper describes the complete system, its design, together with the properties of the fast filling including the recirculation system. Experimental results from the demonstrator actually under construction are also included

Index Terms- Compressed air vehicle; fast filling; buffer reservoir. Energetic properties

I. INTRODUCTION

The fact that humankind passed the 150% threshold in its use of the planet's resources available each year has only alerted a limited number of individuals. Environmental impacts as the 2010 event of the Gulf of Mexico, or more recently the alarmistic messages from the IPCC on the CO₂ concentration in the atmosphere and the related global warming work as triggers of many interrogations. From the scientific community to the political world, there is no doubt that fundamental questions need to be answered, namely that of the unlimited and unconsidered energy consumption per capita [1]. Many sectors of the energy consumption are concerned, but the individual transportation occupies a front place in the list of problematic energy users. After several decades of hesitations following the first oil crisis, the automotive industry finally presented 2010 the first for mass production designed electric car. Significant progress in the energy density of electrochemical accumulators, together with reliable

and performant electric propulsion systems using modern semiconductor devices and permanent magnet synchronous motors have contributed to this important development.

Another advantage of the EV's development is their capability to be integrated in the distribution networks as bidirectional sources, able to support the grid's power demand in critical conditions [2], [3].

Beneath interrogations about the available material resources for a wide expansion and mass production of EVs, one remaining open question is their charging time. Important recent developments have proposed very short charging durations in the range of several tens of minutes. This could be achieved mainly thanks to high performance cooling elements integrated in the battery itself.

If these techniques allow to maintain the battery cell's temperature within acceptable limits, the energy efficiency of the high-power charging process remains a questionable subject, as well as the compatibility of such high-power levels with the grid's power capability at the point of coupling.

In the same category of zero emission vehicles, alternative solutions have been studied like liquid nitrogen [4] or compressed air propulsion systems [5]. This last system has been presented as soon commercially available solution for several years, but its manufacturing company has not yet passed the status of prototypes.

Compressed air cars have of course very limited range due to the poor energy content of their pressurised reservoir. But they can be envisaged as a solution for specific application segments like factory areas, airports, mail delivery where known repetitive tracks represent the dominant part of the use.

Together with the energy content of the cars, the refill time must be considered, as a result of the possible power density of the storage system.

This paper presents the development and design of a fast filling station for a compressed air vehicle dedicated to city delivery and personal transportation on short tracks. A simple design of the air capacity is presented, and the focus is set on the performances of the refill station. An original recirculation concept allows to avoid the energy losses related to the heat-up and cooling of the fast-transferred air.

II THE POOR ENERGETIC EFFICIENCY OF THE FAST CHARGING OF A BATTERY

Charging an electrochemical battery in a short time under half an hour demands a high-power according rel. (1), and is affected with high losses in the battery itself due to the corresponding high current. In rel. (1), E is the energy capacity of the battery, R_{int} its internal resistor, and t_{ch} the charging time. Fig. 1a represents the power needed for the charge of a 25kWh battery in function of the charging time. The internal resistance is given as additional parameter. The corresponding charging current is causing high losses in the internal resistance of the battery and decreases the energy efficiency when the charging time is reduced. Fig 1b illustrates the severe impact of the short charging times on the energy efficiency of the charging process of the same battery [6], [7].

$$P_{ch} = \frac{E}{t_{ch}} + R_{int} \left(\frac{E}{U_0 \cdot t_{ch}} \right)^2 \quad (1)$$

In opposition to the behavior of the electrochemical battery, the next section will describe the way of achieving the fast refill process of an air reservoir under much better efficiency condition.

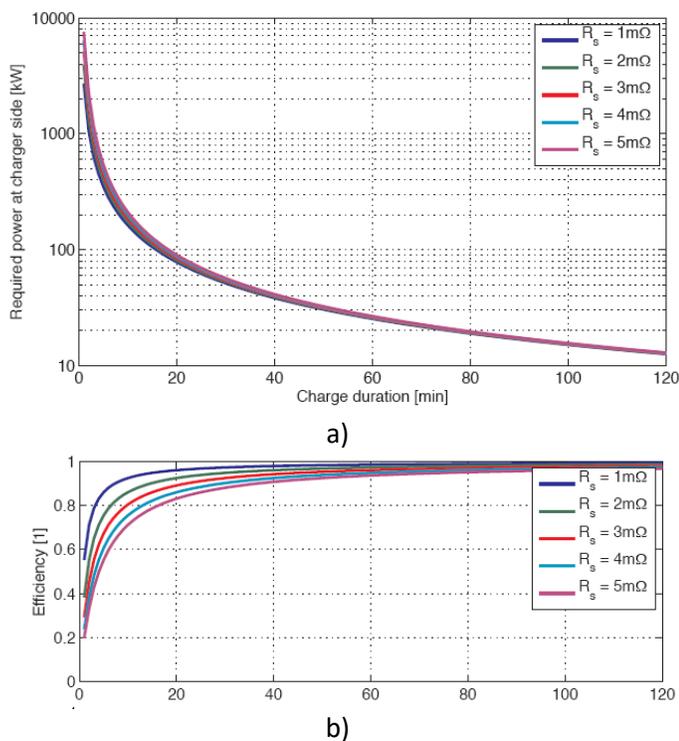


Figure 1 Charge of a battery in function of the charging time
a) Required power
b) Energy efficiency

III AN EVOLUTIONARY CONCEPT OF THE FILLING STATION

Figure 2 represents the different solutions for the filling station of a compressed air vehicle, going from the simplest compressor (K_1) directly connected to the vehicle's reservoir (V_2) as shown in Fig. 2a. The size and power of such a compressor define directly the filling time of the car's reservoir. Non-optimal performance in terms of energetic efficiency is generally characterizing this well

known industrial machinery, even if they are conceived as multi-stage machines dedicated to high pressure output in the range of several hundreds of bar.

Then, Fig. 2b shows the use of a local buffer reservoir (V_1), allowing a fast filling without using an oversized compressor and upstream power source. For this solution, the flowrate of the rapidly transferred air into the vehicle's reservoir is limited by a nozzle, but this air reaches a high temperature due to fast compression, a well-known phenomenon by the fast filling of diver bottles. After transfer, when the vehicle leaves the charging station, the heated air cools down, with first a consequence of a related energy loss, and second, the pressure level of the transferred air after cooling down is reduced, corresponding to a lower state of charge of this accumulator.

In order to skirt the effects of that loss of heat, an original recirculation system is represented in Fig. 2c characterized by the insertion of an additional return line from the vehicles reservoir back to the station's reservoir, allowing to recover the heated air of the vehicle back to the sender reservoir, and to replace it by cold one coming from the same place. This recirculation process does not use a great amount of additional power, the pressures having reached equality between the buffer and the vehicle reservoirs after the transfer. The nozzle has of course to be bypassed during recirculation. The recirculation compressor (K_2) is himself bypassed during the fast transfer and is only activated after pressure equalization.

Figure 2d illustrates the powering from renewable sources as photovoltaics. A frequency converter placed between the PV panels and the compressor's driving machine allows to adapt the power level of the compression to the available source through variation of the rotational speed of the compressor.

A first estimation of the needed air capacity

The estimation of the needed air capacity in the vehicle is based on a rough calculation according the consumption of an equivalent diesel engine. It is supposed that a small delivery vehicle propelled by a two-liter diesel motor is consuming around 8 liters per 100 km. With a density of 0.83 and a weight energy density of 42.5 MJ/kg for the diesel fuel, the energy consumption (tank) corresponds to 282MJ/100km or 78kWh/100km.

The propulsion energy (wheel) is much lower, based on the low energy efficiency of the classical propulsion system of 0.15 [8]. The final propulsion energy consumption becoming 11.7kWh/100km.

The estimation of the needed capacity of the air reservoir is done first on the base of an air propulsion efficiency of 0.3, including the exergy loss due to the use of a pressure reduction valve between the reservoir and the motor. On this base, the stored energy in the reservoir should be equal to 39kWh/100km. Second, the pressurized air reservoir can provide a volume energy density of 23.8 kWh/m³ when the air pressure is of 200 bar.

Finally, a range of 50 km for the delivery vehicle would need a compressed air reservoir of 800 liter corresponding to a weight of 190 kg of air.

The capacity of the local reservoir is chosen as 5 times the capacity of the car's reservoir in order to limit the pressure variations during

the transfer. When the final pressure in the car is defined as 200 bar, the pressure in the local reservoir must be equal to:

$$P_{V_1} = \frac{V_1 + V_2}{V_1} \cdot P_{V_2} = \frac{4 + 0.8}{4} \cdot 200 \text{ bar} = 240 \text{ bar}$$

s

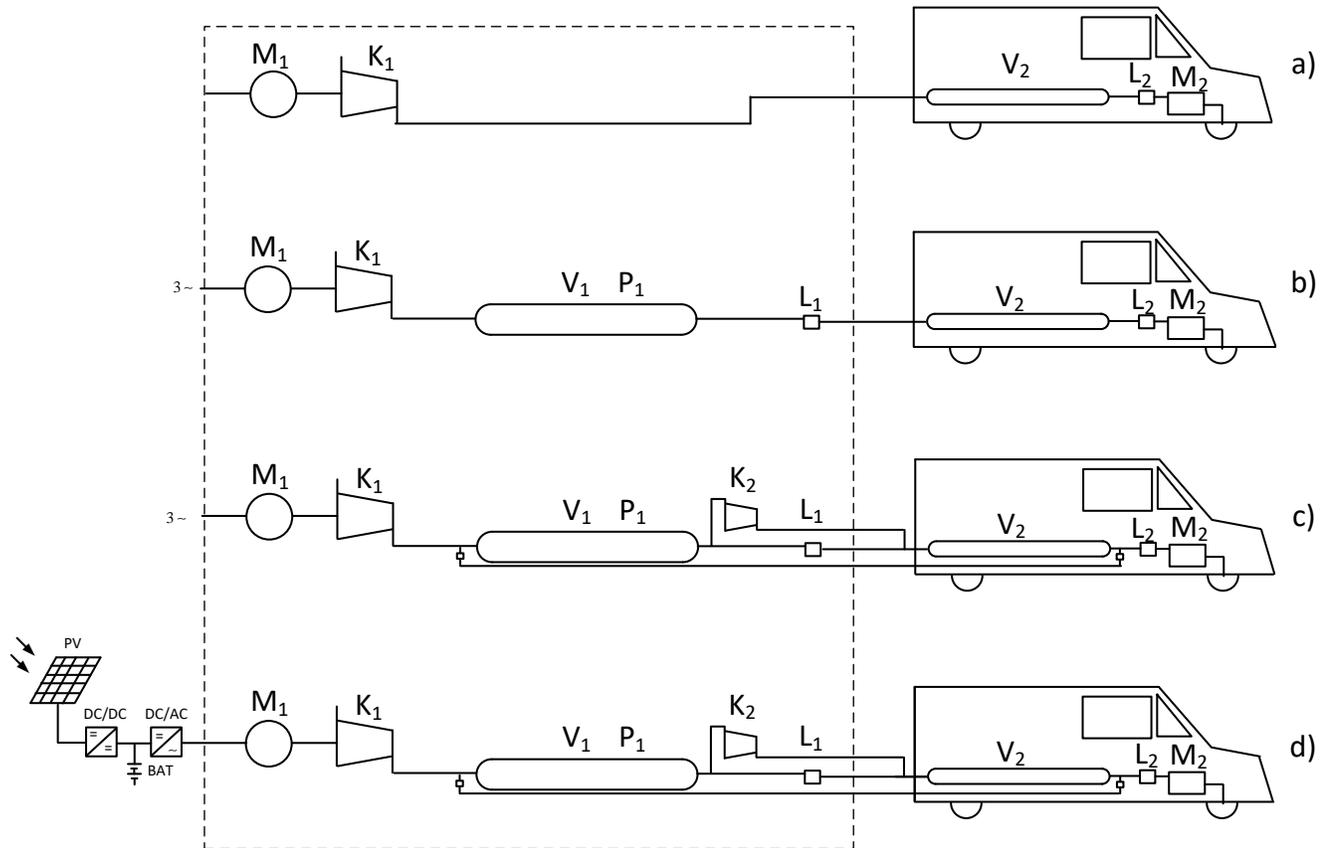


Figure 2 The evolutive concept of the filling station for the compressed air vehicle

- a) Simple compressor
- b) Compressor with buffer reservoir
- c) Addition of the recirculation system
- d) Feeding from renewable sources

Fast filling under good efficiency

The fast transfer of the air from the local reservoir to the car is obtained with the help of a nozzle [9], where the air flowrate is limited without dissipation, reaching sonic conditions. These elements allow to fast fill the car's reservoir under good energy efficiency, but this process presents the drawback of rising the temperature in the receiver due to fast rise of the pressure. After transfer with heating up the air in the car, there is the problem of cooling down this air after leaving the filling station, that would lead to a significant reduction of the pressure. The main consequence is that the possible range would be reduced.

In order to « better fill » the car reservoir, a recirculation system is proposed as described through Fig. 2c, with which the heated air in the car is brought back in the local reservoir after the equalization of the pressures. Such a recirculation of the heated air

corresponds to replacing the hot air by cold one and needs only to compensate the circulation loss if the pressures are really stabilized. The recirculation of the air brings the temperature in the car reservoir down to nearly atmospheric temperature and increases the air density in the car reservoir as shown in Fig. 3 and 4.

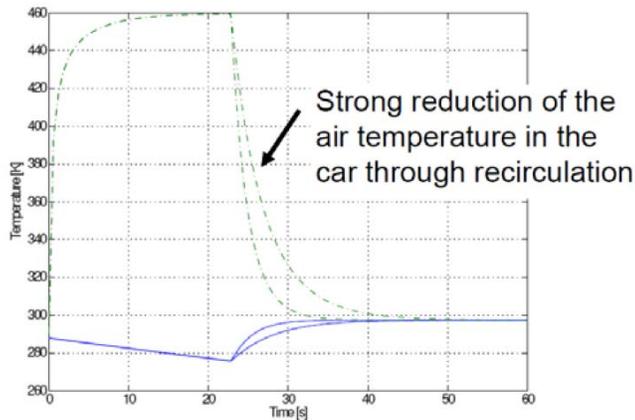


Figure 3 Evolution of the temperature in the car (dotted line) and in the local (full line) reservoirs. The filling lasts from 0 to 23 s, and is followed by the recirculation process. The filling time is adapted to the low volume chosen for a first small volume demonstration equipment, with an air flowrate that causes a similar elevation of the temperature as in the nominal case.

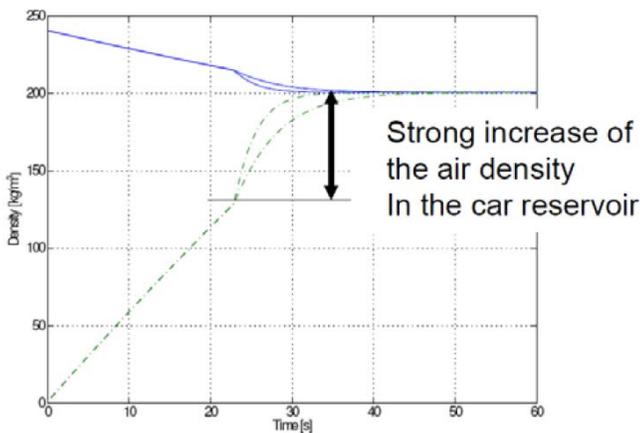


Figure 4 Evolution of the air density in the car (dotted line) and in the local (full line) reservoirs.

In Fig. 4, the effect of the recirculation process on the air densities in both reservoirs is shown. The dotted line shows the main advantage of the recirculation process, which corresponds to an increase of the air density in the vehicle of more than 50% .

IV EXPERIMENTAL SET-UP

Figure 5 shows the experimental set-up used for the verification of the fast filling process. With this equipment, the transfer time has been designed through an adaptation of the nozzle.

The modified delivery vehicle

Figure 6 is a view of the AirPower motor mounted in the vehicle. Mainly the cylinder head is changed, and the distribution and management components have been added. The motor base is identical to the original engine as well as all other motor auxiliaries and the power transmission to the wheels.



Figure 5 The experimental facility for the verification and final choice of the transfer time by adapting the nozzle.

The crankshaft is redesigned for a 90° phase-shift of the efforts produced by each cylinder [10],[11].

In Fig. 7, the experimental vehicle is shown during the first test runs on the test circuit in Rouen, France.



Figure 6 The AirPower engine mounted in the delivery vehicle (courtesy Anthos AirPower)

Figure 7 shows the delivery vehicle on the test track in Saint-Etienne du Rouvray near Rouen, France.



Figure 7 The compressed air vehicle on the test track (courtesy Anthos AirPower).

V CONCLUSIONS

A fast filling station for a compressed air vehicle has been described. The main original contribution consists in a specific recirculation process which avoids the cooling down of the heated

fluid after the fast transfer and allows the fast filling under very good efficiency. For comparison, the energy loss of the fast charge of an electrochemical battery has been analyzed. The original concept is dedicated to a delivery vehicle propelled by a compressed air motor. Prototype equipment is currently set in operation for a real application.

ACKNOWLEDGEMENT

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Assessment Of Cognitive Impairment Hypertensive's Focusing To Lower The Risk Of Dementia

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Abstract- Background: The Study to assess the risk of cognitive impairment in hypertensive patients in different age groups in various territory hospitals.

Objective: This study is aimed to evaluate risk of cognitive impairment in hypertensive patients. To evaluate the association of characteristics of hypertension, including hypertension status, duration, blood pressure (BP), and pulse pressure (PP), with a cognitive function i.e, executive function, in people aged over 45 years, with a past history of hypertension on medication.

Materials and methods: In this retrospective study conducted at multicenters in Warangal, we randomly collected cases with hypertension with its past history since 5- 25years duration in people over aged 45years. The patient's cognitive function was analysed by using Mini- mental state examination and depression severity was examined by using patient health questionnaire.

Results: In this study, 300 patients were examined lively for cognitive function assessment. Overall hypertensive patients were divided into three age groups middle age(45-60yrs), elderly (61-75yrs) and old elderly (>75yrs) and also divided into 3 categories based on blood pressure (Controlled BP <140/<90, Treated but uncontrolled BP >140/>90 and Normotensive BP 120/80). These 3 categories were studied comparatively.

Cognitive performance based on mini mental state examination was found to be Severe in **111**patients (female- 84, Male – 27) in middle age group, **83** patients (female – 50, male – 33) in elderly and **20** patients (female-13, male- 7) in old elderly age group. Mild cognitive performance was seen in **32** patients (female – 20 and male – 12) in middle age group, **23** patients (female-5 and male – 18) in elderly age group. Nil cognitive score was seen in **17** patients of middle age and **13** patients of elderly age group. Depression severity based on patient health questionnaire was found to be mild in **12** patients, moderate in **101** patients, moderately severe in **153** patients and severe in **34** patients respectively.

Conclusion: According to our study, history of Hypertension in middle age may lead to cognitive impairment in late life. In the above analysis it was evident that 111 patients (37%) experienced severe cognition impairment in the middle age i.e, (45-60yrs), 83 patients (27%) in elderly (61-75yrs) and 20 patients (6%) in old elderly age group. Depression status was moderately severe in over 50% of the patients.

I. INTRODUCTION

Hypertension has already been well recognized as a risk factor for cardiovascular and cerebrovascular diseases. Recently, there is an evidence showing that it may also play a role in cognitive dysfunction, increasing risks of related diseases such as Alzheimer's disease (AD) and vascular dementia (VaD). In adults, the hypertensive effects on the brain are thought to be due to systolic blood pressure exceeding the autoregulatory mechanisms of the brain . This results in damage to small cerebral vessels that can lead to impaired autoregulation, lacunar infarcts, amyloid angiopathy, and even cerebral atrophy . In adults, the amyloid angiopathy and cerebral atrophy can look similar to Alzheimer's disease . These changes make it difficult to differentiate HTN that is associated with Alzheimer's disease from vascular dementia secondary to HTN.

Hypertension exerts a more subtle impact on the brain that is revealed by diminished cognitive function. Thus, excluding age, hypertension is the most important risk factor for cerebrovascular pathology leading to stroke and dementia.

Hypertension is a modifiable condition, especially in the early stage, and therefore, it has been hypothesized that antihypertensive treatments might help to prevent early cognitive decline, thus reducing the risk of further neurodegenerative diseases. However, the results on the role that hypertension plays in cognitive decline have been quite inconsistent so far. Several clinical trials failed to draw a conclusion on the effects of controlling blood pressure (BP) on inhibiting cognitive decline due to short study period and low power to detect treatment effects. Numerous epidemiologic studies showed that hypertension in midlife increased the risk of cognitive damage that occurred 20-30 years later, but the outcomes in regards to late-life hypertension were inconsistent. As both AD and VaD have long preclinical phases which are present as mild cognitive decline, a better understanding of the effects of hypertension on cognition in different life stages, especially during and after middle age, is important for preventing both diseases.

The form of hypertension is distinct in middle-aged people (aged 45-59) as compared to in the elderly (aged ≥60). According to Smulyan et al, midlife hypertension is systolic/diastolic hypertension (elevation in both SBP and DBP caused by a raised total peripheral resistance), whereas most of the aged hypertensives present systolic hypertension only (a steady rise in SBP with normal or low DBP due to aortic stiffening). In addition, people over 75 years old tend to have a higher incidence of dementia.

Based on above data, participants in the current study were divided into three groups: middle-aged people (aged 45-59), the young elderly (aged 60-74), and the old elderly (aged ≥ 75). We aimed to investigate the relationship between hypertension and cognition by comprehensively evaluating the age-dependent effects of hypertension status, duration, and blood pressure on cognitive function based on mini-mental state examination.

II. METHODOLOGY

MATERIALS AND METHODS:

- **STUDY SITE :** Mahatma Gandhi Memorial Hospital, Warangal.
- **STUDY TYPE :** Cross sectional study.
- **STUDY PERIOD:** Six months.
- **STUDY CRITERIA:**
- **INCLUSION CRITERIA:**
- Hypertensive patients
- Age above 45
- **EXCLUSION CRITERIA:**
- Memory related diseases like Alzheimer’s disease and Parkinson’s disease.
- Stroke
- Malignant tumours
- Kidney diseases
- Psychiatric problems

SOURCE OF DATA:

- ✓ Patient data records:
 - Patient demographic details.
 - Past history of hypertension.
 - Medication history.
 - Type of heart disease.
 - Blood pressure.
- ✓ Patient interview for cognitive function assessment using questionnaire in mini- mental state examination (MMSE) and depression severity assessment using patient health questionnaire (PHQ).

FORMS INCLUDED IN THE STUDY:

- ✓ Data collection form including patient demographic details, blood pressure, Hypertension status, duration, drug therapy, concurrent disease, heart problem, social status.
- ✓ Mini mental state examination
- ✓ Patient health questionnaire for depression severity assessment.

STUDY PROCEDURE:

1. Subjects with Hypertension are selected based on inclusion and exclusion criteria.
2. Demographic data was collected from patient records.
3. Based on age, hypertensive patients were divided into three groups
 - Group-1 (middle age) – 45-60 years
 - Group-2 (elderly) - 61-75years
 - Group-3 (old elderly) - >75 years.

4. Based on blood pressure 3 groups were categorised i.e, Normotensive (120/80), Controlled Hypertension (<140/<90) and Treated but uncontrolled hypertension (>140/>90).
5. By interviewing patients through mini -mental scale examination, severity of cognitive impairment was analysed.
6. Cognitive impairment was categorised based on scores obtained by each patient into a) mild b) moderate c) severe and d) nil cognitive impairment.
7. By interviewing patients through patient health questionnaire, depression severity was analysed.
8. Depression severity was categorised based on scores into a) minimal, b)mild, c) moderate, d) moderately severe and e) severe.
9. The data collected throughout 6months from 300 patients is analysed.
10. The summarized data was entered in Microsoft Excel.
11. Patients were separated based on age, cognitive impairment severity and depression severity and significance was obtained.

III. RESULTS AND DISCUSSION:

Table 1: Gender wise distribution

Gender	Total number of patients
Male	116
Female	184

Table 2: Age wise distribution:

Gender	45-60 years	61-75years	>75 years	Total
Male	47	62	7	116
Female	114	57	13	184
				300

Figure 1 : Educational status

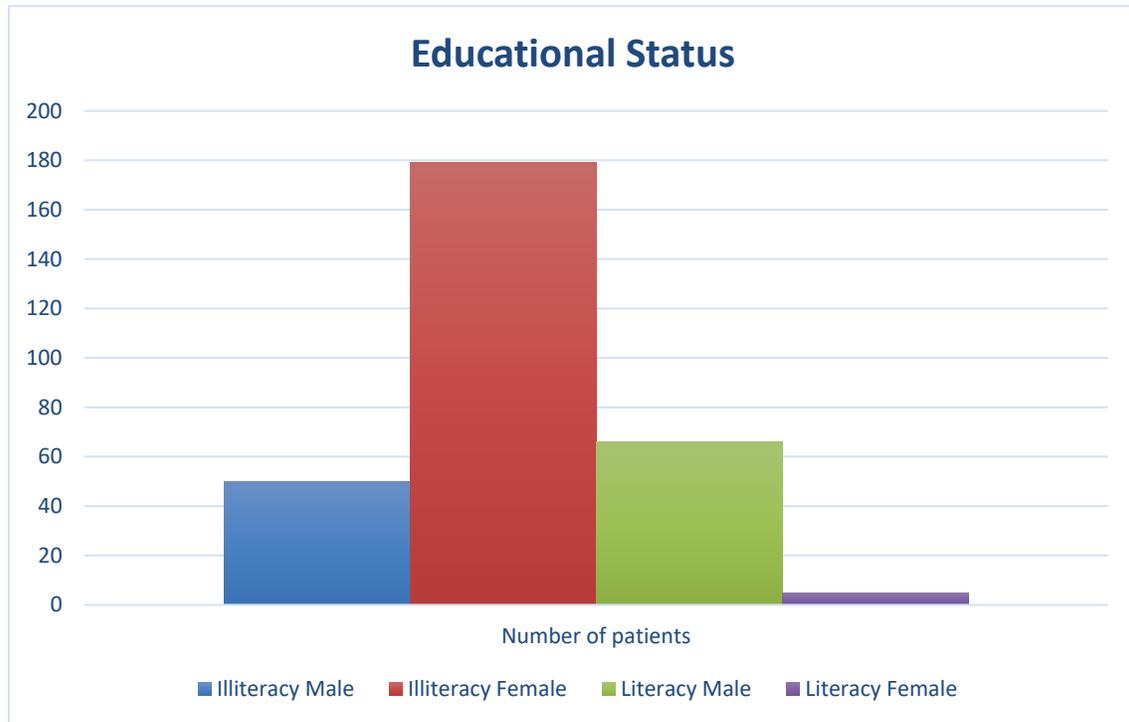


Table 3: Hypertension status

HTN status	Male	Female	Total	Percentage
Controlled	66	106	172	57.3%
Treated but uncontrolled	48	77	125	41.6%
Normotensive	2	1	3	1%

Table 4: History of Hypertension duration

Duration	Number of patients
0-5	54
6-10	168
11-15	63
16-20	10
21-25	05

Table 5: List of concurrent diseases.

Disease	Number of patients
Coronary artery disease	94
Hypertension	53
Angina	53
Left ventricular dysfunction	25
Systolic Hypertension	09
Congestive Cardiac Failure	08
Systemic Hypertension	07
Systemic Hypertension with diabetes	04
Angioplasty	04
Others	34

Table 6: ANTIHYPERTENSIVE DRUGS

DRUGS	No of patients
Telmisartan	103
Atorvastatin	29
Enalapril	29
Amlodipine	22
Atenolol	17
Carvedilol	06
Losartan	02
Metoprolol	01
Olmesartan	01
Clinidipine	01

Figure 2: Depression Severity

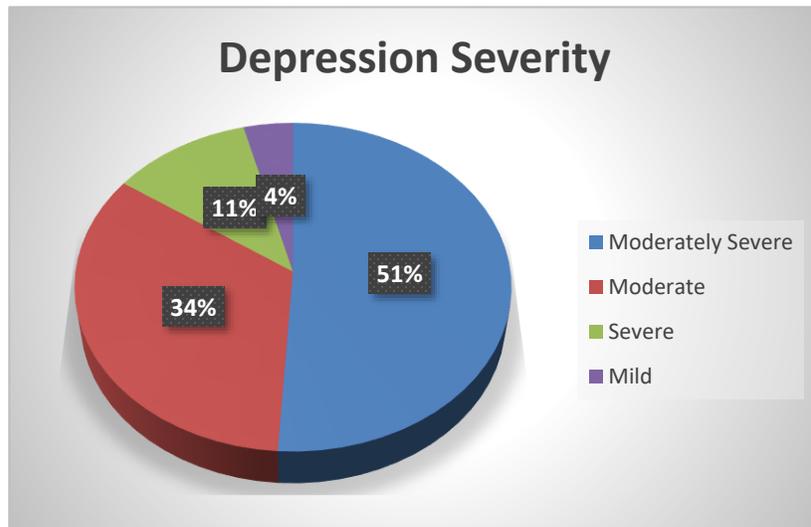
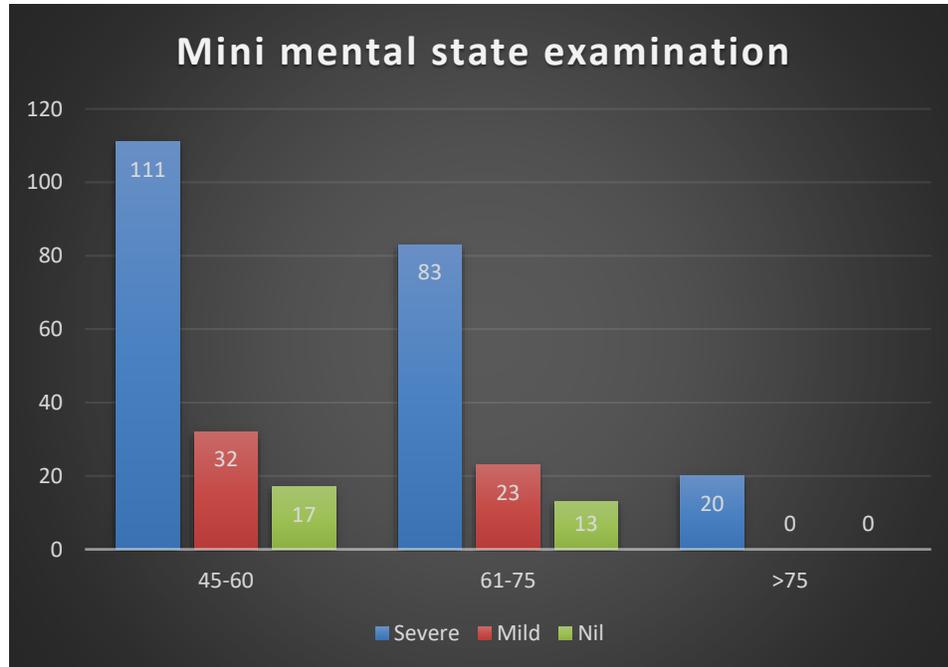


Table 7 : Mini mental scale examination (cognitive impairment)

Age (years)	Severe	Mild	Nil
45-60	32	17	111
61-75	23	13	83
>75	0	0	20

Figure 3: Mini mental state examination



IV. DISCUSSION:

- In our hospital based study, data was collected from 300 patients.
- Demographic analysis of this retrospective study revealed that out of 300 patients:
- **116 (38.66%)** were males and **184 (61.33%)** were females.
- **192(64%)** belong to rural areas and **108(36%)** belong to non-rural areas.
- All hypertensive patients were divided into 3 categories based on age i.e, middle age (**45-60**) **53.66%**, elderly (**61-75**) **39.66%**, and old elderly (**>75**) **6.66%**.
- Based on blood pressure, patients were divided into
- Controlled hypertension (**<140/<90 – 172 [57.3%]**),
- Treated but uncontrolled hypertension (**>140/>90 – 125 [41.6%]**) and
- Normotensive (**120/80 – 3 [1%]**).
- Overall, **Severe** cognitive impairment was seen in **111(37%)** patients of middle age and **83(27.6%)** patients of elderly age group.
- Depression was found to be severe in **34(11.3%)**, moderately severe in **153(51%)**, moderate in **101(33.6%)** and mild in **12(4%)**.
- Among all hypertensive patients, **94(31.5%)** were diagnosed with coronary artery disease and 53(17.6%) have only hypertension history.
- Telmisartan is being used by 103(34.3%). Atorvastatin in 29(9.6%), Enalapril in 29(9.6%). Two and three multiple anti- hypertensive drugs were prescribed in **24(8%)** and **7 (2.3%)** respectively.

- The outcomes of the study revealed that middle aged hypertensives also experience severe cognition impairment in which females contribute to high percentage. Coronary artery disease is the main concurrent disease along with hypertension which may increase the risk of dementia.

V. CONCLUSION:

The results of present study shows that people aged 45-60 years are compensated by the cognitive deficits brought by hypertension. Treated but uncontrolled hypertension and systolic blood pressure may be risk factors for the cognitive decline in people aged 60-75 years. Untreated, treated but uncontrolled and increased pulse pressure may predict cognitive degeneration in people aged >75 years. Females are more prone to Hypertension than males. Illiteracy is likely to be associated with poor health status and self reported chronic morbidity. Midlife hypertension more likely better reflects the long term effect and duration of hypertension effect on brain.

According to our study, history of Hypertension in middle age may lead to cognitive impairment in late life. In the above analysis it was evident that 111 patients (37%) experienced severe cognition impairment in the middle age i.e, (45-60yrs), 83 patients (27%) in elderly (61-75yrs) and 20 patients (6%) in old elderly

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Education For Sustainable Development And Case Study Tasks On Some Endemic Plant And Animal Species

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Abstract- Education for sustainable development with the collaboration of the State Committee for Nature Protection, Ministry of Public Education and the Ministry of Higher and Secondary Specialized Education of the republic of Uzbekistan was adopted and stages of sustainable development are represented. Besides environmental problems of the south Uzbekistan region are closely illustrated with the case study tasks of the endemic plant species in the article.

Index Terms- sustainable development, education, case study, endemic, plant, degradation, Uzbekistan, ecology, environmental education, program, assessment.

I. INTRODUCTION

For Central Asia countries, as UNECE (United Nations Economic Commission for Europe) members, it is known that "...sustainable development is a complex issue, encompassing economic, environmental and social dimensions. In other words, development is essential to satisfy human needs and improve the quality of human life. At the same time, development must be based on the efficient and responsible use of all of society's scarce resources - natural, human and economic". It is important to outline the following goals of the UNECE Strategy on ESD (Education for sustainable development): Ensure that policy, regulatory and operational frameworks support the promotion of ESD; Promote SD (sustainable development) through formal, non-formal and informal learning; Equip educators with the competence to include SD in their teaching; Ensure that adequate tools and materials for ESD are accessible and Promote research on and development of ESD¹.

The most significant achievement of Uzbekistan in 2011 in the field of ESD was adoption by Resolution No.20/2/305 (dated 19th June, 2011) on "Concept education in purpose of sustainable development" with participation of the State Committee for Nature Protection, Ministry of Public Education and the Ministry of Higher and Secondary Specialized Education. Environmental problems of Uzbekistan regions are closely connected with the decrease of the natural landscape's productivity, depletion of water systems and soil erosion. Education is a key tool for a transition to sustainable development through the forming of knowledge, skills, abilities and the opinions of people required for their active participation towards sustainable development and an interconnected solution to economic and social challenges in accordance with the requirements of environmental protection (www.carec.kz). In Uzbekistan, curricula, programs and standards of formal education reflect educational strategies supporting only EE (Environmental education) as one of the ESD components. The program, "World surrounding us", is taught in first and second grades and integrated into such subjects as botany, biology, chemistry, geography and others. Non-formal ESD is implemented preferably through non-governmental organizations and non-commercial organizations in the Republic of Uzbekistan. Non-governmental organizations actively working in ESD sphere include the www.ecomaktab.uz, www.econews.uz, www.uznature.uz and others. So this article includes of the environmental education and nature protection through studying case study tasks and it helps to students to develop viewpoints of students to sustainable development of the country.

¹ www.carec.kz Progress review on education for sustainable development in central Asia: achievements

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II. METHOD OF RESEARCH

In the higher educational institutions, we can use case study tasks, brain storming, modular learning technologies to develop viewpoints of students for sustainable development, because one of the most promising learning systems is that it is best adapted to the system for developing students' cognitive and creative abilities [7]. In traditional education, the learning objectives are expressed through pedagogical activity, that is, education, while the modular learning, case study, brain storming are expressed through the activities of the learners and focuses on professional activities.

III. RESULTS AND THEIR DISCUSSION

The key strategic ideas for sustainable development in Uzbekistan are reflected in the following strategic and program documents, such as: Nukus Declaration of Central Asian States and the International Community on Sustainable Development of the Aral Sea Basin (September 5, 1995); The Decree of the President of the Republic of Uzbekistan dated on May 20, 2011 № PD (President Decision)-1533, that about "On measures to strengthen the material and technical bases of higher education institutions and improve the quality of training of highly qualified specialists"; National Action Program for 2003-2015 under the UNESCO the project of "Education for All"; National Action Plan on the protection of environment noted for 2008-2012; The decision of the Cabinet of Ministers of the Republic of Uzbekistan dated on May 27, 2013, № 142, "On the Program of Action for the Protection of Environment in the Republic of Uzbekistan for 2013-2017"; The decree of the President of the Republic of Uzbekistan of "About Strategy of Action for the Future Development of the Republic of Uzbekistan" in February 7, 2017, №PD-4947 will be based to develop the sustainable development education [1,2,3,4,5,6].

The main purpose of Sustainable Development Education is to integrate the ideas and principles of sustainable development with all forms and stages of education, and to educate those who are able to think independently, critically, socially, economically, and environmentally and actively.

And promoting the development of new activities including nanotechnology for scientific activities and sustainable development [8,9] is one of the main activities. In sustainable development education, for example, in ecology teaching we can use the case study tasks. Assessment of students' knowledge,

skills and abilities are obtained on the basis of case study test tasks in ecology and nature protection. Some case study tasks are given in the followings.

Reflection I

In the following, there are theoretical materials, you should read it and describe your viewpoints on the case study tasks into tables:

There are about 4500 species of wild higher plants and over 2000 species of fungi in the territory of Uzbekistan. About 400 of them are rare, endemic and relict species (10-12% of flora). Effective measures are necessary for their protection. Although the status of flora protected in the reserves is rather good, natural stocks of wild species have sharply reduced. The current state of coenotic (cenotic) populations of 5 plant species were listed in the Red Book of the Republic of Uzbekistan from the territories of the Kashkadarya region, such as: *Dianthus uzbekistanicus* Lincz., *Eremurus robustus* (Regel) Regel, *Salvia lilacinocoerulea* Nevski., *Iris magnifica* Vved., *Tulipa fosteriana* W. Irving. So their reproduction are not available.

During the field research, two coenotic populations of *D. uzbekistanicus* were studied (Figure 1.). Both coenopopulations grow in the Zeravshan ridge, in the area of the Takhta-Karachi pass.

The first coenopopulation of *D. uzbekistanicus* was studied on the northwestern slopes of the Zeravshan ridge (Takhta-Karach pass) as part of the wheatgrass community on a typical serozem (Figure 1.). The total projective cover of the grass stand is 80%. The high density of grass stands is associated with the absence of anthropogenic impact (the described site is located in a fenced area). In this case, the share of the studied species does not exceed 5%. The floristic composition of the community is quite rich and it consists of 33 species of vascular plants (Table 1.). But this index is not sustainable because of anthropogenic influence.

The second coenotic population of *Dianthus uzbekistanicus* grows on the southwestern slopes of the Zeravshan ridge (in the vicinity of the Takhta-Karach pass) as part of a herb-wormwood community. *Artemisia tenuisecta*, *Elytrigia trichophora*, and *Hypericum perforatum* predominate in the plant community. The soil is coarse-grained. The total projective cover of the grass stand does not exceed 36%, and the projective cover of the studied species in this community barely reaches 2%. The floristic composition of the community consists of 19 species of vascular plants, the vast majority of which are perennials (47%).



Figure1. *Dianthus uzбекistanicus*

Table 1. – The species composition and their abundance of grassland-hawthorn community

No.	Name of the plants	Life form	Projective cover, %
1	<i>Crataegus turkestanica</i>	Tree	10
2	<i>Rosa sp.</i>	shrub	2
3	<i>Acantholimon sarawschanicum</i>	A little shrub.	+
4	<i>Thymus seravschanicus</i>	Semi-shrub	3
5	<i>Ziziphora clinopodioides</i>	Semi-shrub	2
6	<i>Elytrigia trichophora</i>	perennial	16
7	<i>Stipa sp.</i>	perennial	5
8	<i>Hypericum perforatum</i>	perennial	8
9	<i>H. scabrum</i>	perennial	8
10	<i>Centaurea squarrosa</i>	perennial	2
11	<i>Helichrysum mussae</i>	perennial	+
12	<i>H. maracandicum</i>	perennial	2
13	<i>Plantago lanceolata</i>	perennial	3
14	<i>Tragopogon sp.</i>	perennial	+
15	<i>Salvia serawschanica</i>	perennial	+

Continuation of Table 1.

16	<i>Astragalus sewerzowii</i>	perennial	2
17	<i>A. mucidus</i>	perennial	3
18	<i>Ferula kuhistanica</i>	perennial	+
19	<i>Galagania fragrantissima</i>	perennial	2
20	<i>Dianthus uzбекistanicus</i>	perennial	5
21	<i>Eremurus olgae</i>	perennial	1
22	<i>Gagea sp.</i>	perennial	+
23	<i>Lindelofia macrostyla</i>	perennial	+
24	<i>Delphinium semibarbatum</i>	perennial	+
25	<i>Potentilla sp.</i>	perennial	+
26	<i>Convolvulus lineatus</i>	perennial	+
27	<i>Aster canescens</i>	perennial	+
28	<i>Ixiolirion tataricum</i>	perennial	+

29	<i>Poa bulbosa</i>	perennial	5
30	<i>Verbascum songaricum</i>	Two-year	+
31	<i>Bromus macrostachys</i>	annual	1
32	<i>Veronica stylophora</i>	annual	+
33	<i>Lappula sp.</i>	annual	+

Reflection II

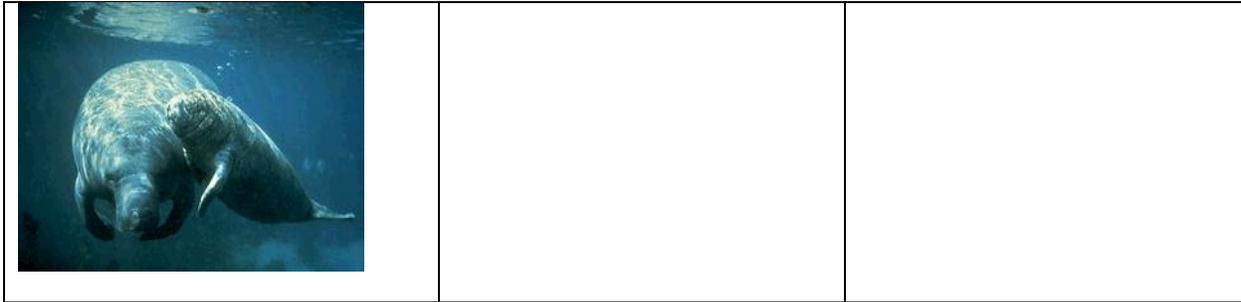
So, desertification of pasture ecosystems is one of the essential problems in Uzbekistan. It became apparent through increase of barchans area; increase of extremely saline soils with lighted plant; communities of hyper halophytic species; vanishing of shrubby dominants with final sinuses of ruderal plants (*Peganum harmala*, *Karelinia caspica*, *Aeluropus litoralis*, *Limonium otolepis*). Billions of dollars are spent for restoration of Aral Lake and for an improvement of this ecological catastrophe, but situation has not changed much, and water level is still going down.

Now we should fulfill following tasks:

Case study task 1.		
Types of problems	Origin of the problems	To inhibit the problems
Represent the decreasing of endemic plant species in the South Uzbekistan		
Arising of degradation		

Case study task 2.		
Types of problems	Origin of the problems	To inhibit the problems
Desertification of pasture ecosystems		
Sand movement		

Case study task 3		
Some threatened species	Ways that species become Endangered	What can you do to help endangered species?
<p>✓ The spotted owls</p>  <p>✓ Tigers</p>  <p>✓ Manatee or sea cow</p>	<ol style="list-style-type: none"> Habitat loss Unregulated or illegal killing or collection Pesticides, pollution Competition with other species Disease Predation 	<ol style="list-style-type: none"> Get educated about local endangered species. Visit a nearby national wildlife refuge or nature center. Volunteer. Don't buy species illegally taken from the wild. Don't buy products made from threatened or endangered species.



IV. CONCLUSION

Education for sustainable development offers many opportunities for students. As a result of the integration of science, each student feels the essence and content of environmental problems. Their creativity is enhanced by doing case studies during the course. They are able to think and understand that each species has its own role in nature. So, it is necessary to generalize and enlarge of ESD in Uzbekistan. In this process it is demanded to publish teaching materials by using of foreign news on ecology and ESD. At last, we should note and work out the plans on ecological events and celebrate eco-dates at educational institutions.

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Victims And Victimology In India– Need For Paradigm Shift

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Abstract- The Criminal Justice system in India is derived from the British model where control and prevention of crimes, punishment and rehabilitation of offenders and protection of individuals and their property are some of the accepted principles. Many countries of the world have realized the need to extend assistance and services to the victims of crime thereby changing their way of dealing with them. Nevertheless, the position of victims has not yet changed in India where they are treated as mere witnesses for prosecuting and punishing the offenders. As such they are deprived of their rights.

This paper intends to analyze the plight of victims of crimes under the Indian Criminal Justice System. The present descriptive and analytical secondary data based study has been conducted with an objective to understand the legal provisions in the Indian Criminal law with respect to rights of victims vis-à-vis various rights they entitled to in other countries. This paper also suggests changes that could be brought in the Criminal Justice system to ensure victim's rights and to bring in the concept of victimology. Enacting laws for victim's welfare and ensuring them conducive environment are some of the suggestions of the study.

Index Terms- Victims, Victim's rights, Criminal Justice System, Victimology, Victim's welfare.

I. INTRODUCTION

When a crime happens there may be numerous offenders, victims and the criminal justice administrators otherwise called the crime investigating officers. The role played by all of them is different – the offender is the one who commits the crime, affected by various factors and circumstances; the victims are those who suffer physical, social, financial or emotional injury or harm which needs to be promptly redressed by providing them easy access to justice¹ and finally, the justice provider and the persons involved in the mechanism in rendering justice is collectively known as the criminal justice system. The criminal justice system is a mechanism established by governments in its endeavour to control crime by punishing and imposing penalties on those who violate laws². The following are, *inter-alia*, five important components of the criminal justice system:

- Law enforcement
- Prosecution
- Defence attorney
- Courts and
- Corrections.

Unfortunately, the rights of victims are not considered as one of the major components of the criminal justice system in India.

Thus, the author of this paper has analyzed the concept of victimology as applied in various countries and is desirous to put forth the changes that may be brought in the criminal justice system in India considering the victims as the fulcrum of the system. Victimology can be regarded as a more holistic approach than criminology, acknowledging the systemic injustices that may lead victims to become perpetrators themselves. It also helps reduce the likelihood that perpetrators will commit additional offenses, because it can help them rethink about the individuals they might otherwise victimize³.

II. CONCEPT OF VICTIMOLOGY

Victimology is the scientific study of victimization, which includes the relationship between victim and the accused, the interaction between victim and the criminal justice system i.e. the police and the courts and the correctional officials⁴. This concept also has an implied relationship with social groups, institutions, media, business and social movements.

“Victims” means persons who, individually or collectively, have suffered harm, including physical or mental injury, emotional suffering, economic loss⁵ or substantial impairment of their fundamental rights, through acts or omissions that are in violation of criminal laws operative within Member States, including those laws proscribing criminal abuse of power.

Victimization is the process of being victimized or becoming a victim, the action of singling someone out for cruel or unjust treatment. We can say that victimization is the relation between victim and the accused, there is no exact definition available on it. There are different theories of victimization which are as follows:

- Primary victimization
- Secondary victimization (post crime victimization)

¹ Prof. N.V. Paranjape: Criminology, Penology, Victimology (2018) p. 763

²<https://victimsofcrime.org/help-for-crime-victims/get-help-bulletins-for-crime-victims/the-criminal-justice-system>

³unafei.or.jp/english/pdf/PDF_rms/no56/56-07.pdf

⁴ Supra 2.

⁵ Andrew Karman: crimes victims: An introduction to victimology (2003) P. 7.

- Re-victimization (repeatedly became the victim)
- Self-victimization (variety of reason to justify abuse)

Victimology can also be regarded as the study that outlines the steps to be taken to prevent victimization against crimes and provide legal remedies to the victims of crime. The impact of victimization on crime affected persons drew attention of criminal law jurisdictions around the world and they were convinced that victims need to be treated with compassion and dignity and their fundamental rights must be protected and preserved.

III. ADVENT OF VICTIMOLOGY

Victimology has traced back to 1920's itself. But in 1940 the founders of this branch of knowledge, Mendelsohn, Von Hentig and Wolfgang initiated the use of the term victimology. This is not a new concept; even before the study on victims was started, there were numerous victims in the society.

IV. DEVELOPMENT OF VICTIMOLOGY⁶

[1] 1924	[2] Edwin Sutherland includes a chapter on victims in his criminology textbook
[3] 1937	[4] Benjamin Mendelsohn publishes his writings on the rapist and his victim.
[5] 1941	[6] Hans von Hentig publishes article on victim and criminal interactions.
[7] 1947	[8] Benjamin Mendelsohn coins the term "victimology" in a French journal.
[9] 1948	[10] Hans von Hentig publishes his book The Criminal and His Victim.
[11] 1949	[12] Frederic Wertham first used the word "victimology" in a book Show of Violence.
[13] 1957	[14] Margery Fry proposes victim compensation in the London Times.
[15] 1958	[16] Marvin Wolfgang studies homicide victims; uses the term "victim precipitation".
[17] 1963	[18] New Zealand enacts the first Criminal Compensation Act.
[19] 1965	[20] California is the first state in the USA to start Victim Compensation.
[21] 1966	[22] Japan enacts Criminal Indemnity Law.
[23] 1966	[24] USA starts to survey crime victims not reported to the police.
[25] 1967	[26] Canada creates a Criminal Compensation Injuries Act as does Cuba and Switzerland.
[27] 1968	[28] Stephan Schafer writes the first victimology textbook The Victim and His Criminal.
[29] 1972	[30] The first three victim assistance programmes are created in St. Louis, Missouri, San Francisco, California and in Washington, D. C.
[31] 1973	[32] The first international symposium on victimology is held in Jerusalem, Israel.

[33] 1974	[34] The first police-based victim advocate project is started in Fort Lauderdale, Florida, USA
[35] 1975	[36] The first "Victim Rights' Week" is organized by the Philadelphia District Attorney, Pennsylvania, USA.
[37] 1976	[38] John Dussich launches the National Organization of Victim Assistance (NOVA) in Fresno, California, USA.
[39] 1976	[40] Emilio Viano launches the first scholarly journal devoted to victimology.
[41] 1976	[42] James Rowland creates the first Victim Impact Statement in Fresno, California, USA.
[43] 1979	[44] The World Society of Victimology is founded in Munster, Germany.
[45] 1980	[46] Mothers Against Drunk Drivers (MADD) is founded by Candi Lightner after one of her twin daughters was killed by a drunk driver who was a repeat offender.
[47] 1981	[48] President Ronald Reagan proclaims the first national Victims' Rights Week in April
[49] 1982	[50] the first Victim Impact Panel established by MADD to educate drunk drivers about how their victims suffered, started in Rutland, Massachusetts, USA.
[51] 1984	[52] The Victims of Crime Act (VOCA) establishes the national Crime Victims Fund from federal crime fines to pay for state victim compensation and services .
[53] 1985	[54] The United Nations unanimously adopts the Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power.
[55] 1987	[56] The US Department of Justice opens the National Victims Resource Centre in Rockville, Maryland.
[57] 1988	[58] The first "Indian Nations: Justice for Victims of Crime" conference is held by the Office for Victims of Crime in Rapid City, South Dakota, USA.
[59] 1990	[60] The European Forum for Victim Services was founded by all the national organizations in Europe working for victims of crime in consultative status with the Council of Europe and the UN.
[61] 1999	[62] The United Nations and the US Office for Victims of Crime publish the Guide for Policymakers on the Implementation of the United Nations Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power and the Handbook on Justice for Victims: On the Use and Application of the United Nations Declaration of Basic Principles of Justice for Victims of Crime and Abuse of Power.

⁶Md. Atiqur Rahman :Victimology : Concept and History of Victimology. P.8

[63] 2002	[64] On 11 April, 66 the Rome Statute was ratified & went into force on 1 July at which time the International Criminal Court became effective and it included the creation of a Victim and Witness Unit.
[65] 2003	[66] On October 2nd the Tokiwa International Victimology Institute, in Mito Japan opened its doors to promote victim rights, to conduct seminars, courses, publish an international journal, and host annual symposia and lectures and research about victimology.
[67] 2004	[68] The World Society of Victimology at its annual Executive Committee meeting in Orlando, Florida adopts a dramatic new strategic plan to commit itself to the ideals and promises of the UN Declaration .
[69] 2005	[70] Japan puts the UN Basic Principles of Justice for Victims of Crime and Abuse of Power into their national legislation by adopting a new fundamental law for crime victims. To ensure that the principles would be initiated, the Prime Minister established a cabinet level committee. The new law includes services for victims, restitution from the offender, information about criminal justice and a right to formally participate in the criminal justice process.

proving the offender guilty and awarding punishment. After playing their role as witnesses in the proceedings, the victims are forgotten and marginalized. They are not provided with any assistance and when they are not cared of, it creates a sense of angst in them which may subsequently lead to distortions in the Criminal Justice System. Therefore, there is a dire need to shift our focus from the offenders to the victims who have suffered substantial injury. As like how the transformation to crimes from torts took place we also need such transformation on this regard. In case of a cognizable offence, if a victim of the offence approaches the police to give information, the police is obligated to record the information in writing and the same after being read out to the victim/informant has to be signed by the informant. The police cannot refuse to provide the informant with a copy of the First Information Report according to sec. 154(1) and (2) of Cr.P.C. The victim/informant can send the information in the form of writing to the Superintendent of Police provided the police denies to record the same under sec.154 (3) of Cr.P.C. If in case the police officer refuses to investigate the matter, he/she is required to state the reason for not proceeding with the issue to the informant in the form of facts. This is laid down in sec. 157(2) of Cr.P.C. Generally, the complainants are not treated well by the police and at times instead of attending to their grievances they are being harassed at police stations. Not every time the complaints are recorded truthfully by the police and in many cases the facts are either manipulated or distorted according to their convenience. Offences that are cognizable are made as non-cognizable and vice-versa. We can also find that many a times accused himself gives the complaint and the investigation is initiated by him. These may be some potential reasons why the victims get themselves detached from the system as such.

V. PLIGHT OF VICTIMS IN INDIA⁷

In India victims are deprived of their rights under the criminal justice system and they are treated as mere witnesses for prosecuting and punishing the offenders. Victims who have suffered harm are just compensated for the damages that they have suffered through civil law and the accused is held responsible for such compensation. Compounding the victim is considered as justice under the Indian Criminal Justice System.

- I. The Constitutional Remedies for Human Rights Violation
- II. The Criminal Procedure Code, 1973 (herein Cr.P.C)
- III. The Fatal Accidents Act, 1855
- IV. The Probation of Offenders Act, 1958
- V. The Motor Vehicles Act, 1988

Victims of a crime are awarded with compensation for the loss they have suffered based on the above mentioned statutes.

Protecting citizens and their property from any kind of harm is considered as the primary objective of the state under the Criminal Justice System. The state, therefore, carries on this duty by ensuring that the citizens do not take law into their hands to satisfy their interests. When a crime is committed, against the norms and principles of the society, state itself becomes a victim for prosecuting and punishing the offender. Criminal Justice system concentrates on the crime, the offender, trial of the case,

Though victims under sec. 190 of Cr.P.C. have the right to approach the Magistrate directly with his complaint thereby avoiding the redress by visiting the police station, the process of investigation is entirely in the hands of the police. The victims have their role only when the police feel so. Only in certain states the police are instructed to provide the victims with the information regarding the investigation process when they ask for it. The plight of the victims is pitiable until and otherwise the police file the charge sheet under sec.173 of Cr.P.C. The Magistrate after taking cognizance of the charge sheet decides as to whether the proceedings can be dropped and if so, he issues notice to the informant to hear his grievances as required of him. But the dropping of the proceedings would not provide the victim with an opportunity to be heard. Under sec.250 of Cr.P.C. the informants are required to pay compensations to those accused of offence without just cause/reason under the direction of the Magistrate. It is recognized under sec.357A of Cr.P.C. that conviction of the offender is not required to provide victims with financial reliefs. Also, the compensation can be availed through the Code of Criminal Procedure, 1973.

The state governments along with the central government will provide the scheme for compensation. Compensations under this scheme can be provided for the victims of a crime who have suffered substantial loss or damage as well as for their dependants who need compensations. Based on the recommendation made by

⁷ Nida Zainab Naqvi, *Rights Of Victims In India's Criminal Justice System- Analysis*, Eurasia review (Feb. 22, 2016),

<https://www.eurasiareview.com/22022016-rights-of-victims-in-indias-criminal-justice-system-analysis/>.

the court for awarding compensations, the District/ State Legal Service Authority will decide on the quantum that can be awarded as compensation. Further, under sec.358 of Cr.P.C., the court is empowered to order compensations to be made by a person to another who was wrongfully arrested by the police officer due to the incorrect information given by the former. If a person is convicted for a non-cognizable offence, expenses that he has incurred for proceeding with the prosecution is refunded to him based on the order of the court under sec.359 of Cr. P.C.

Under sec.5 of the Probation of Offenders Act, 1958, trail court is empowered to pass an order to award compensation to the victim. Such an order can only be passed by the trail court. The means through which fine can be recovered by attaching and selling of the offender's movable property and arrears of land revenue from movable as well immovable property is provided under sec. 421 of Cr.P.C. The courts under sec.431 of Cr.P.C. are empowered to recover money, except fine, which is payable in compliance with any order made as if it were a fine under the Code.

The recommendations from the *Malimath Committee* clearly stated that justice for victims and the Indian criminal justice system are inseparable. It argues that victims of a crime have to be involved in the criminal proceedings as a matter of right and they must be allowed to seek compensation for the loss or damage suffered. It emphasizes for holistic justice to the victims. It has also accurately pointed out that the increase in the number of hostile witnesses over the years is a result of inadequacy of law in protecting the witnesses.

In India we can find that numbers of offences committed are increasing whereas the reporting of the crimes is decreasing though numerous number of people every year are suffering both physical as well psychological damages which are the effects of the crime inflicted upon them. Due to fear of victimization by the perpetrators and their reprisals, the victims as well their relatives most of the times fail to provide information regarding the crime inflicted upon them. Therefore, crime prevention and detention becomes arduous for the police. Undoubtedly, witnesses play a major role in assisting the police in investigation process as well adducing evidence in the court to ensure successful criminal prosecution.

VI. RIGHTS OF VICTIMS- AN INTERNATIONAL PERSPECTIVE

The rights of the victims in America and Canada are analyzed below. In America, under the Crime Victims' Rights Act (18 U.S.C. § 3771. Crime victims' rights), victims have the right to

- Be protected from the accused
- Court proceedings and parole
- Participate in the escape or release of the accused
- Participate in court proceedings unless if restricted by the court.
- Be heard at the court which includes the right to plea, sentence and release without any delay

- Restitution both fully and timely in accordance with law
- Be treated fair and with respect to ensure his/her dignity and secrecy.
- Conferred with an attorney on behalf of/for the Government to deal with the case⁸.

Under the Victims Bill of Rights Act, 2015, the victims are provided with statutory rights in Canada. They have the right to be heard and seek information, participate in trial and other court proceedings, ensure protection from the state especially the federal department when there is a breach of their rights and restitution. When a complaint is lodged by the victim for breach of his/her rights, under the Victims bill of rights Act the federal department and other agencies to whom the complaint is filed is required to maintain a transparent mechanism where the complaints can be reviewed by the victims, recommendations can be made to make corrections to infringement, if any and keep the victims informed of the review and its results. Victims also have the right to file complaints regarding the services provided to them, against police and offenders. According to the provincial law, these complaints will be addressed. Victims are also funded through the Victims Fund of the federal government which has increased the level of the complaint mechanisms and as well is a remedy to victims. Victims also are provided with the right to involve themselves in the process of investigation of crime, prosecution, release of the offender which includes conditional release, etc⁹.

Access to justice and fair treatment, compensation, assistance and restitution are also recognized as major components of victim's rights by the UN Declaration.

Council of Europe in 1996 started implementing the victim's rights in the process of criminal justice. On June 14, 2006, the Council of Europe adopted the recommendation on assistance to crime victims.

VII. ROLE OF JUDICIARY IN ENSURING RIGHTS OF VICTIMS

"Justice is not only in the end result; it is also in the process". Traditionally, control and prevention of crimes, punishment and rehabilitation of offenders and protection of individuals and their property were the only accepted principles of the criminal justice system. Therefore, there is a need to expand the meaning of justice. Justice should not be confined only to conviction or acquittal of the accused but also must ensure to inspire the confidence of the witnesses for conviction of the guilty and particularly the victims of the crime. The victims by providing information regarding the crime set the criminal justice system in motion and the greatest relief available to them is access to justice. In cases of rape, the entire case becomes baseless due to the delay in the collection of samples and here the victims being women and children are deprived of the access to justice. The rape victims, sometimes, for the purpose of taking evidence are held in protective custody which lacks no legal basis as such. The victim is not entitled to engage an advocate of his/her choice even though the accused is. ¹⁰Under sec. 24(8) of Cr.P.C the victim, for the purpose of prosecution, can engage an advocate of his/her choice

⁸ ibid

⁹ ibid

¹⁰ *Role of Judiciary in Protecting Victims Rights*, Legal Services India (March 17, 2018, 03:38 AM),

to assist the former only if the court permits him for the same. The advocate so engaged is bound to act under the directions of the prosecutor and can submit written arguments after the taking of evidence only if permitted by the court [s. 301(2) of Cr.P.C].

Restitution of the victims though not a statutory right in India has to be made legislative because examining the plea of the victims for redressal or for the loss suffered is not sufficient. The Code of Criminal Procedure has recognized the compensation of victims as a right but making it available only if a substantive sentence of fine is imposed and limiting it to the amount of fine actually realized is reducing the scope for compensation. Though under sec. 357(3) of Cr.P.C. fine can be imposed by the Magistrate, where it has not been imposed, courts are inconsistent in invoking this section. The Law Commission in its 152nd Report had recommended that sec. 357A of Cr.P.C. has to be introduced which prescribes that in case of bodily injury which has not resulted in death, compensation amounting to Rs. 25,000/- should be awarded to the victims at the time of sentencing and in case of death Rs. 1,00,000/-. Under this section if the compensations awarded in accordance with sec. 357 of Cr.P.C. are not adequate for rehabilitation of the victim or if the case ends in an acquittal or discharge of the accused, the court is empowered to order the state to pay such compensations for the victim's rehabilitation. The victim is also entitled to request the State or District Legal Services Authority for rehabilitation even if the accused is not tried. Sec. 357A of Cr.P.C. was introduced/ incorporated only after it was mandated by the 154th Law Commission Report. The point to be noted here is that for a section to be implemented in practice it takes years together which is unhealthy to a state as it delays justice for the victim.

The statement of the victim can be obtained by a lady police officer at the residence of the victim in the presence of a guardian in case of the offence of rape under sec. 157 of Cr.P.C. Victims as well witnesses are entitled to give audio-video confession and their testimonies which may be recorded by an audio-visual electronic device under sec. 164(1) of Cr.P.C. These sections are only in paper but how effective they are in the present day is still questionable/ doubtful. In the case of *Rattan Singh v. State of Punjab*¹¹, the court pronounced that the distress of the victims of a crime and their dependants does not attract the attention of the law which is a weakness of our jurisprudence. Reparation of victims indeed is still the vanishing point of the Indian criminal law.

In the case of *Sakshi v. Union of India*¹², the "in-camera" trials were mandated by the Supreme Court to maintain the dignity of the victims particularly in case of offences like rape and when the victim is a child. In the case of *Nirmal Singh Kahilon v. State of Punjab*¹³, the Apex court held that victims of a crime are also entitled with the right to fair investigation, equally like the accused, as provided by our Constitution under Article 21. Supreme Court in the case of *Bodhisattwa Gautham v. Subhra Chakraborty*¹⁴ observed that the court also has the right to award interim compensation when trying offences of rape instead of

awarding compensation at the final stage. The accused can also be ordered to pay Rs. 1000/- as interim compensation to the victims along with the arrears of the compensation from the date of complaint. The right to get relief from the public law courts that exercise writ jurisdiction was laid down in case of *Nilabati Behra v. State of Orissa*¹⁵. The Supreme Court observed that ordinary remedy from civil suits is not enough to relegate the heirs of the victims of custodial deaths. The base for victim compensation in cases of custodial death is also established by the High Courts¹⁶.

From the above discussed cases it is clear that the legislations as well the purview of the criminal justice system has changed. Though the system along with the judges plays a significant role in the expansion of victims' rights in our country, yet due weightage has not been given to the victim's rights and they have not received their due concern. Victims have only very few legal rights in our country and they are not notified of the court proceedings or of the release or arrest of the accused. They also do not have the right to make statements regarding sentencing at the court as well in other hearings. Programs for assisting the victims are more or less non-existent.

VIII. SUGGESTIONS

The author of this paper would suggest a need for a Bill for the protection of the victims that ensures the victim's with their basic rights, encourages the judiciary to respond to their needs and facilitates the state to assist the victims. A victim not only includes the person who has suffered the loss or injury but also their dependents who have equally incurred the loss. Every state government can create an online complaint portal for their respective state which would include all details of the complaint, investigation and officers who are in-charge for the investigation. The Central Government can come up with a Toll-free Number to facilitate the lodging of complaints. It can be made mandatory that the investigation of a female victim could be conducted by a women police officer who is above the rank of constable. The Central Government can allocate victim's suffering fund for the immediate treatment of the victims. Fast track court system can be adopted so that the whole process of justice could be completed at the earliest.

IX. CONCLUSION

The entire criminal justice system in India is offender oriented. Many a times even the judiciary, the legislative and the executive is concerned about the rights of the accused or the criminal. The criminal justice system has to function thereby to provide justice to the victims for which the judicial system must be accessible to those who demand justice. If the system fails to ensure that the victims and witnesses voice out without fear, participate in court proceedings, have their interests and rights

<http://www.legalservicesindia.com/law/article/8/5/Role-of-Indian-Judiciary-in-Protecting-Victims-Rights>.

¹¹ 1980 SCR(1) 846.

¹² A.I.R. 2004 SC 3566.

¹³ 2009 1 SCC 441.

¹⁴ A.I.R. 1996 SC 922.

¹⁵ (1993) 2 SCC 746

¹⁶ Supra 10.

protected, then justice would remain only in letter and not in spirit. Needless to say, the system should also guarantee the protection of victim's families for their testimonies to be true and prosecution to be fair. Our society always blames the victim for the crime and not the actual offender. The situation would have been different had the rights of the victims been taken care by the state and the law been tough on the offenders. To empower the distressed victims and to assure them with their rights, the above said suggestions need a legislative frame work.

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Hybrid Cryptography Using A Super Server For Encryption And Decryption

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Abstract- The world of encryption is evolving every year. Hybrid encryption is a unique technique which combines both symmetric and asymmetric encryptions. This research study focuses on using a super server to create unique private keys which is in turn used for encryption and decryption of data. It is an efficient and modified technique which makes use of 'Hybrid Cryptography'. In this technique of hybrid cryptosystem, a public-key cryptosystem (asymmetric cryptosystem) with a highly efficient symmetric key is used. The technique of using a super server provides secured data encryption which ensures user's privacy, authentication and usability. Three different algorithms are being used for the encryption and decryption processes. Here, the super server works as an intermediate generating duplicate private keys which the client makes use of for the decryption of data. This technique provides increased security as well as authentication compared to other existing hybrid algorithm and the speed is also doubled as the technique makes use of two private keys and the generation of duplicate private keys ensures that the data is less prone to hacking.

Index Terms- Symmetric Keys, Asymmetric Keys, Hybrid Cryptography, Encryption, Decryption, Cipher text, Hacking

I. INTRODUCTION

Data security has become the need of the hour in the digital world we live in. In the past decade with the phenomenal growth in Science and technology, the hacking crime rates have also accelerated at an alarming rate. Internet on a larger scale has curbed the right to privacy of data of thousands of users throughout the world. In every field we step in, today almost all the web traffic is encrypted. This is advantageous for businesses and common man, since it shields against pirating content during the data transfer from the server to the client and back again to the server. Major existing threat in cryptography is hacking. Hackers also use encryption for their attacks and it becomes difficult to spot the hackers in the encrypted traffic.

However, with the advent of new techniques in cryptography the crime rates have reduced as the human race came out with the concept of Hybrid Cryptography which allows the users to transfer data in a secured way and also the process of transferring data periodically occurs at a faster rate. This technique makes use of the combination of symmetric and asymmetric encryption processes. The drawbacks encountered in using the public key encryption which was speed and security is overcome by the technique of Hybrid Encryption. Public key encryption

technique makes use of simpler algorithm and uses two different keys hence results in increased processing time and this technique is highly prone to hacking. To overcome these disadvantages, hybrid cryptosystem was introduced. But the loophole in Hybrid Cryptography lies in the fact that, the generation of symmetric keys by the client or the server can easily be introspected as there is no central control and the data can easily be altered and destroyed. Hence a technique which involves a central control like that of the super server is necessary to overcome this and the process of generating duplicate keys by the super server which is used for encryption and decryption ensures the security of data on a larger scale and this technique also results in increased speed.

II. PROPOSED TECHNIQUE

The proposed technique involves a super server placed strategically in geographical locations closer to the maximum user group to avoid delays and this helps in generating new private keys which is used by the clients or the receiver. If there is more than one client then for each client every time during the process a new private key is generated for a specific public key. Consider a scenario in which User A wants to encrypt a message and send to User B, the decryption and encryption process is as follows according to my assumptions:

III. ENCRYPTION

- The sender obtains User A's public key.
- Generates a private key (symmetric key) and sends it to the super server.
- The key sent by the User A is considered as a duplicate private key and the super server generates a new private key.
- The message is also encrypted using the symmetric key generated by the super server.
- The key encapsulation along with data encapsulation is then sent to User B.

IV. DECRYPTION

- User B uses its symmetric key to decrypt the new private key generated by the super server.
- If the private key of User B matches, User B uses the symmetric key generated by the super

server to decrypt the message thus converts the cipher text to plain text.

Hence this technique provides security and is highly reliable as only authenticated user groups can receive and send data. This technique can be adapted in implementing secure processes like **digital transactions, online trading** as the mechanism is advantageous over other techniques like Public key Infrastructure as the speed is also enhanced and the size of the data is not increased as in the case of Public Key Infrastructure. This technique outperforms in **efficiency and security** compared to its predecessors.

V. EXISTING TECHNIQUE AND MOTIVATION FOR THE RESEARCH WORK

With the focus to resolve the speed and security issues in the public key Infrastructure, Hybrid Cryptography was introduced. Hybrid Cryptography makes use of a combination of symmetric and asymmetric cryptography; hence there was an enhancement in speed. In Hybrid Cryptography technique the sender generates a symmetric key during encryption which is later used by the receiver to decrypt the data but the loophole lies in the fact that while the server generates the symmetric key, it is susceptible to hacking as the data can easily be introspected. To solve this security issue was the motivation behind my research work. In the existing technique, User A would obtain the public key of user B, generates the symmetric key and encrypts the data in the form of cipher text. The encapsulated key and data is sent to User B. User B would use its symmetric key to decrypt the newly generated private key using which it decrypts the message. In the

recent times, data security has become a serious issue and the proposed technique of using a super server would resolve all the data security issues and is advantageous over other techniques as it involve simple mechanisms and can be widely used for cloud computing security.

VI. SUMMARY

Lack of privacy and data security has been a major cause for several cyber-crimes. The issue brought by **Facebook's Cassandra** has created a sense of fear in the minds of Internet users throughout the world. Cryptography provides several solutions to offer secured data transfer and communication. The proposed technique of using a super server is a modified technique of Hybrid Cryptography which is an optimized and efficient way for quicker and secured communication of data. It also helps to put an end to hacking and data theft across the globe especially in online banking transactions and in data transfer of national affairs.

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Characterisation And Transesterification Of *Allanblackia Floribunda* Seed Oil For Production Of Biodiesel

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Abstract- Oil was extracted from the seed of *Allanblackia floribunda* using hot water floatation method. The oil was characterized and used for production of biodiesel through transesterification process. Evaluation of the properties of the biodiesel obtained was done. Physicochemical properties of the oil were measured and the results obtained show that the oil is edible and can also be used for industrial purposes. The viscosity of oil was $30 \text{ Cm}^2\text{S}^{-1}$, density 914 kg/m^3 , smoke point $210 \text{ }^\circ\text{C}$, flash point $270 \text{ }^\circ\text{C}$, cloud point $25 \text{ }^\circ\text{C}$ and refractive index of 1.464 nD_{40} . Transesterification was carried out at a temperature of $60 \text{ }^\circ\text{C}$ for 60 minutes with 6:1 mole ratio of the methanol to oil and 1 gram of KOH as catalyst. Results obtained from the evaluation of the biodiesel were compared with ASTM and EN standards and the values compared well. The fuel properties of the produced biodiesel met the specification given by standards. The yield of fatty acid methyl ester (FAME) obtained was 91.62% in GC-MS analysis. The study supports the production of biodiesel from *Allanblackia floribunda* seed oil as a viable alternative to the diesel fuel.

Index Terms- Transesterification, Biodiesel, *Allanblackia floribunda*, Seed Oil, Methyl ester

I. INTRODUCTION

The rise in energy demand and carbon dioxide emissions associated with the use of fossil fuels has driven the search for alternative energy sources which are renewable and have a lower environmental impact (Atabani *et al.*, 2013 and Ho *et al.*, 2014). Therefore, it is very clear that biodiesel will contribute immensely to the energy demands of the populace in the near future. Biodiesel has advantage of fossil fuel because of its non emission of carbon dioxide in the air so there will be complete elimination of carbon dioxide emissions lifecycle with the use of Biodiesel. When compared with petro-diesel, it reduces about half of the emission of particulate matter, unburned hydrocarbons, carbon monoxide, most part of the polycyclic aromatic hydrocarbons and entire sulphates on an average (Du *et al.*, 2004). The biodiesel molecules are simple hydrocarbon chains, containing no sulfur, or aromatic substances associated with fossil fuels. They contain higher amount of oxygen (up to 10%) that ensures more complete combustion of hydrocarbons (Global Farmer, 2009).

Transesterification is the most common methods used in production of mono alkyl esters of vegetable oils and fats, which is now known as biodiesel when used for fuel purposes. (Bull and George, 2015). The methyl ester produced by transesterification of vegetable oil has a high octane number, low viscosity and improved heating value compared to those of pure vegetable oil which results in shorter ignition delay and longer combustion duration and hence low particulate emissions. The use of biodiesel will help the environment by reducing greenhouse gas emissions. Some of the well-known non-edible oil seed producing plants are *Jatropha (jatropha curcas)*, *Karanj (pongamiapinnata)*, *Castor (ricinus communis)*, *Rubber (hevea brasiliensis)* seeds. India, Indonesia, Malaysia and China are already producing biodiesel successfully from *Jatropha curcas* and oil palm (Haque *et al.*, 2009).

Allanblackia floribunda seed also known as tallow tree seed belongs to the family *Guttiferae* and genus *Allanblackia*. It grows in parts of Central, East and West African countries including Nigeria, Ghana, Democratic Republic of Congo, Uganda and Tanzania in moist lowland and upland rainforest. It is an evergreen medium-sized tree, up to 30m tall with a cylindrical or slightly fluted trunk and a narrow crown supporting horizontal branches. It has a fairly smooth bark and simple opposite leathery leaves evenly distributed along the branches of the tree. A matured tree produces about 100-150 egg-shaped brown fruits of weight between 1.2 and 4.0 kg. The fruits contain 25-40 oil-rich brown seeds, with a seed containing 68-72% oil (Dike and Asuquo, 2012).

II. MATERIALS AND METHODS

Materials

The fruits of were obtained from Okehi in Etche local government area of Rivers state, Nigeria. The methanol and anhydrous potassium hydroxide (KOH) (Analytical grade) were obtained from the department of Chemistry, Rivers State University, Port Harcourt.

Extraction of oil from *Allanblackia floribunda* Seeds

Hot water floatation method described by Rosenthal *et al.*, (1996) was used. It was followed with some modification made by Alenyorege *et al.*, (2015).

Characterization of the *Allanblackia floribunda* seed oil

Moisture content, Density, cloud point, melting point, Smoke point, flash point, Viscosity, free fatty acid content, Acid value, Peroxide value, Saponification value and Iodine value of the oil were determined using the methods described by the American oil chemist society official Method of analysis (AOCS, 2012) and Official analytical methods of analysis, 14th edition, Association of Official Analytical Chemists, Washington D.C. AOAC, (2012).

Transesterification Procedure of *Allanblackia floribunda* oil

The transesterification experiment was carried out in batch method at a reaction temperature of 45 using 0.5g Potassium hydroxide catalyst concentration of v/v to *Allanblackia floribunda* oil at 6:1 ratio methanol to *Allanblackia floribunda* oil and a reaction time of 60min. The experimental procedure was conducted according to methods explained by previous researchers (Aranisola *et al.*, 2012 ; Deng *et al.*, 2011 and Bull and George, 2015).

Biodiesel analysis

The physiochemical properties analyzed were: density, kinematic viscosity, flash point, cloud point, and Saponification value according the ASTM standard methods.

Biodiesel yield

The biodiesel yield was calculated from the Fatty Acid Methyl Ester (FAME) and oil weights

$$\text{Yield, \%} = \frac{\text{Total weight of FAME}}{\text{Total weight of oils in the sample}} \times 100$$

(Kansedo *et al.*, 2009)

III. RESULTS AND DISCUSSION

Physiochemical Properties of *Allanblackia floribunda* oil.

Physicochemical properties of *Allanblackia* oil are presented in the tables below.

Table 1: Physical properties of *Allanblackia* seed oil (ASO)

Parameter	ASO
Refractive index (n _{D40})	1.464
Slip melt point (°C)	42.5
Cloud point (°C)	25
Density (kg/m ³)	914
Moisture content (%)	0.16
Smoke point(°C)	210
Flash point(°C)	270
Viscosity (cm ² /s.), @40°C:	30

Table 2: Chemical properties of *Allanblackia* seeds oil

Saponification Value (mgKOH/g)	198
Iodine Value(wijs)	39
Free Fatty Acid (%)	1.15
Peroxide Value (mEq/kg).	0.86

Table 3: Physiochemical Properties of Biodiesel from *Allanblackia* Seed Oil

Parameter	ASOB	ASTM D 6751	EN 14214
Clarity	Clear liquid	Clear liquid	Clear liquid
pH	8.3	8.0	7.8
Density, kg/m ³	880	870-900	860-900
Flash point°C	142	>130	>120
Kinematic Viscosity 40°C mm ² /sec ⁻¹	5.1	1.9-6.0	3.5-5.0
Cloud point, °C	14		
Free Fatty Acid (FFA)%	0.05		
Saponification value (mgKOH/g)	192		

Key: ASTM D 6751 American standards and EN 14214 European Standards

ASOB: Allanblackia Seeds Oil Biodiesel.

Biochemical composition

Table 4: Fatty acid methyl ester profile of the produced biodiesel

Fatty acids	Structure (%)	Amount
	C6.0	11.18
Myristic (C14:0)	C14.0	10.69
Palmitoleic (C16:1)	C16.1	14.12
Stearic acid (C18:0)	C18.0	32.00
Oleic acid (18:1)	C18.1	11.18
Arachidic (C20:0)	C20.0	3.98
Eicosenoic (C20:1)	C20.1	8.47
Total		91.62

IV. DISCUSSION

Physical properties of *Allanblackia* seed oil

The results in table 1 show that the value of the refractive index of the oil was 1.464 (nD 40°C). The refractive index value obtained falls within the range reported for some fats in the nut family (1.45 -1.49) as reported earlier by Eckey, (1954). The melting point of *Allanblackia* oil was 42.5 °C and clouds at 25 °C. The melting point is relatively very high compared with cocoa butter, palm kernel oil and shear butter which have been reported to be between 32 - 36 and 25 - 30°C and 32 - 42°C respectively(Bockish, 1993). The relatively high melting point is an indication that the oil will be good for confectionary industry. The melting point of oil is related to their degree of unsaturation. The higher the degree of unsaturation, the lower the melting point. Density of the oil was 0.914 g/ml measured at 40 °C. The density of vegetable oils is temperature dependent and decreases in value when temperature increases. The moisture content value was 0.16%. High moisture content is undesirable as it will lead to hydrolysis of the oil. Smoke point was 210°C. The flash point of the oil was 270 °C. Flash point defines the temperature at which the decomposition products formed from frying oils can be ignited. Viscosity of *Allanblackia* oil measured at 40°C was 30mm²/s. Viscosity values estimate oil's relative thickness or resistance to flow. Viscosity is important to diesels and biodiesels because it has impacts on the operation of some engine components such as the fuel pump.

Chemical Properties

The results in table 2 show the summary of some chemical properties of *Allanblackia* oil. Saponification value was 198 mg KOH/g. Saponification values of oil is inversely related to the average molecular weight of the fatty acids in the oil. Generally, fats and oils with high proportion of shorter carbon chain lengths of the fatty acids have high saponification values (Kirk and Sawyer, 1991). Low molecular weight fatty acids have more glyceride molecules per gram of fat than high molecular weight acids and hence greater saponification value. Coconut oil contains appreciable quantities of low-molecular weight fatty acids and has high saponification value (251 - 264) (Aurand *et al.*, 1987). The saponification value obtained in this work was lower than that of

coconut oil but close to that stated for palm oil (190 - 209) by (Bockish, 1993), indicating relatively higher molecular weight acids (Ellis *et al.*, 2007).The smaller the Saponification value the larger the average molecular weight of the triglyceride. The Iodine Value of fats and oils is an important characteristic which determines the degree of unsaturation. The iodine value of the *allanblackia* oil was 39wijs, is lower than the range of 50 - 55 specified by Codex Alimentarius (Codex Standard 2001, 2003) The values were relatively low indicating a low degree of unsaturation or high degree of saturation of the *Allanblackia* oil. Peroxide value was 8.6 meq/kg. These values are within the acceptable limit of 10 mEq/kg for fat or oil stated by NIS, (1992), for edible oils.

Physiochemical properties of the Biodiesel

Table 3 shows the Physiochemical properties of biodiesel produced from *Allanblackia* oil compared with the biodiesel American standards ASTM D 6751 and European Standards EN 14214. The pH value was 8.3. This is a little bit higher than the set value by ASTM D 6751 and EN 14214. However, some countries accept pH range of 8-10. Monitoring pH provides a measure of the progress of the biodiesel reaction.

The Density of the biodiesel was 880 kg/m³ which is within the standard range of standards given. Density and other gravities are important parameters for diesel fuel injection systems. The values must be maintained within tolerable limits to allow optimal air to fuel ratio for complete combustion. High-density biodiesel or its blend can lead to incomplete combustion and particulate matter as reported earlier by Galadima *et al.*, (2008).

The flash point for the biodiesel was well above the 130°C minimum ASTM recommended range and therefore no risk of fire outbreaks in case of accidents. Sulistyo *et al.*, (2008) gave similar report. The kinematic viscosity of the biodiesel (5.1 mm² sec⁻¹) is within the recommended ASTM range of 1.9 to 6.0 mm² sec⁻¹. This means that the biodiesel can flow easily. This parameter is important to biodiesel because it has affects the operation of the fuel pump of engines. Cloud point was 14 °C. This is the temperature at which crystals first start to form in the fuel. At this point the engine cannot run and is a big problem in temperate region. It is therefore, important that cloud point of biodiesel be low. Free Fatty Acid content in the biodiesel was low 0.05%. High free fatty acid is undesirable as it an indication of deterioration. Saponification value is used in checking adulteration. Saponification value for the biodiesel was 192 mg KOH/g. High saponification value indicated that oils are normal triglycerides and very useful in production of liquid soap and shampoo. This may have contributed to the low yield of biodiesel produced due to separation challenges.

Fatty acid methyl ester profile of the produced biodiesel

Table 4 shows the values for the fatty acid methyl ester of the biodiesel produced.

V. CONCLUSION

The oil can be used in the confectionary industry. The low degree of unsaturation, acid and peroxide values indicates that the oil can be stored in plastic containers for a period of at least five months without deterioration. The cloud point of the oil suggests

that it will not be good for paint production.. The physiochemical properties of biodiesel produced met the ASTM and EN standard specifications for biodiesel. The methyl ester of *Allanblackia floribunda* Seed oil can be successfully used for biodiesel production.

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Association Between Body Mass Index and Severity of Androgenic Alopecia in Men

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Abstract

Background: Androgenic alopecia is the most common type of hair baldness in men. Obesity is a risk factor that can cause androgenic alopecia. Until now the relationship between body mass index (BMI) and the severity of androgenic alopecia is still controversial. **Aim:** This study aimed to determine the association between BMI with the severity of androgenic alopecia in men. **Methods:** The study was analytic observational with cross-sectional design. The sample is men who are suffering from androgenic alopecia in the working area of the Sukaramai Community Health Center. Consecutive sampling was used to collect samples. Chi square analysis results are significant if the p value is < 0.05 . **Results:** A total sample of 66 subjects was obtained in the form of 49 samples (74.2%) with mild and moderate severity of androgenic alopecia and 17 samples (25.8%) with severe androgenic alopecia severity. Characteristics of research subjects with the largest population based on age range, BMI, education level, and risk factors respectively were 46-55 years (33.3%), normal BMI (57.6%), high school / equivalent (51.5%), and family history (42.4%). Chi square analysis results showed no relationship between BMI and the severity of androgenic alopecia in men ($p = 0.242$). **Conclusion:** There is no association between BMI and the severity of androgenic alopecia in men.

Keywords: androgenic alopecia, body mass index, men

I. INTRODUCTION

Androgenic alopecia is the most common type of hair baldness in men that causes poor self-image, low self-esteem and significant negative impact on a person's quality of life so that most of them seek both alternative medicine and medical treatment.¹ At least 80% of Caucasian men will show the incidence of androgenic alopecia at the age of 70 years.²

Based on studies on the prevalence of androgenic alopecia in China, 21.3% of men suffer from androgenic alopecia with the highest prevalence found in men over 70 years of age.³ One of the most common factors that causes androgenic alopecia is family history with a predisposing factor of 80%.⁴ The severity and early onset of androgenic alopecia are more common in men who have a family history of androgenic alopecia. There is other risk factors that also cause androgenic alopecia including smoking, alcohol use, hypertension, obesity, and age.^{5,6}

Men who suffer from obesity will cause an increase in androgenic alopecia more often than men with a normal body mass index (BMI).⁵ However, some studies show no association between increased BMI and the incidence of androgenic alopecia.⁷ Because the result of the studies are still controversial and data regarding androgenic alopecia are still lacking in Indonesia, researchers want to examine whether there is an association between BMI and the severity of androgenic alopecia in men.

II. METHODS

The study design was observational analytic with cross-sectional design. The study was conducted at the Sukaramai Health Center. The samples in this study were men who suffer from androgenic alopecia with consecutive sampling data selection method. The dependent variable was the severity of androgenic alopecia and the independent variable was the BMI of subjects suffering from androgenic alopecia.

The study subjects were excluded if under 18 years of age, did not meet the criteria for androgenic alopecia according to the Norwood-Hamilton Scale, had BMI < 18.5 kg/m², were taking drugs containing finasteride and minoxidil, and had had a hair transplant. The study was conducted after obtaining approval from the ethics committee regarding the implementation of health research NO: 40/TGL/KEPK FK USU-RSUP HAM/2018. Data collection was carried out after the subject agreed to inform consent. History taking was taken to exclude the exclusion criteria. After the subject criteria are met, data collection is conducted in the form of interviews using research status and research questionnaire. Subject's body weight and height were measured using a body scale and a height gauge which are validated. The type of baldness of the subjects was measured using the Norwood-Hamilton Scale.^{8,9}

Risk factors such as family history, hypertension, smoking, and type 2 diabetes melitus were collected through history taking. Family history was defined as subeject's father suffering from androgenic alopecia. Hypertension was defined as subject was diagnosed

by doctor suffering from hypertension. Smoking was defined as subject smoked more than 100 cigarettes in the past 6 months. Type 2 diabetes melitus was defined as subject was diagnosed by doctor suffering from type 2 diabetes mellitus.

Chi square was used to analyze data. Data are grouped into two groups. Subject BMI was divided into normal BMI (18.5-25.0 kg/m²) and obese BMI (≥ 25.1 kg/m).¹⁸ The severity of androgenic alopecia was divided into mild-moderate (Norwood-Hamilton grade I-IV) and severe (Norwood Hamilton grade V-VII). In addition, data in the form of age, BMI, education level, and risk factors^{3-5,14,16} obtained through interviews are presented in the form of frequency. Association between risk factors and the severity of alopecia androgenic are also analyzed using Chi square. In this study, the value of $p < 0.05$ was considered significant. Data were processed using SPSS computer program.

III. RESULTS

There were a total of 66 subjects collected from October 2018 to November 2018. The number of subjects with mild and moderate severity of androgenic alopecia were 49 subjects (74.2%) and 17 subjects (25.8%). Subjects with normal BMI were 39 subjects (59.1%) and obese BMI were 27 subjects (40.9%). The highest age range was in 46-55 years (early elderly), namely 22 subjects (33.3%). The highest level of education is high school / equivalent of 34 subjects (51.5%). Risk factors found which were family history, hypertension, smoking, and type 2 diabetes mellitus were 28 (42.4%), 11 (16.7%), 27 (40.9%), and 3 (4, 5%) (Table 1).

Table 1. Data Characteristics of Alopecia Androgenik responden.

Characteristics	n	%
Grade severity :		
Mild-moderate	49	74,2
Severe	17	25,8
BMI :		
Normal (18.5-25.0 kg/m ²)	39	59,1
Obese (>25.0 kg/m ²)	27	40,9
Agre range :		
17-25 age (late adolescent)	0	0
26-35 age(early adulthood)	8	12,1
36-45 age (late adulthood)	16	24,2
46-55 age (early erderly)	22	33,3
56-65 age (late erderly)	16	12,1
>65 age (seniors)	4	6,1
Level of education :		
Primary school/equivalent	5	7,6
Junior high school/equivalent	12	18,2
High school/equivalent	34	51,5
College	15	22,7
Risk Factors :		
Family History	28	42,4
Hypertension	11	16,7
Smoking	27	40,9
Type 2 diabetes mellitus	3	4,5

The results of the SPSS analysis showed no association between BMI and the severity of androgenic alopecia in men ($p = 0.242$). The results of cross tabulation calculations can be seen in table 2. The results of cross tabulation showed no association between risk factors and the severity of alopecia androgenic in men. The association between risk factors and mild-moderate vs. severe are family history 18 v 10 ($p = 0.112$), hypertension 9 v 2 ($p = 0.529$), smoking 23 v 4 ($p = 0.91$), and type 2 diabetes melitus 2 v 1 ($p = 0.759$). The results of analysis can be seen in table 3.

Table 2. Analysis of the association between BMI with the severity of androgenic alopecia in men.

	Grade severity of androgenic alopecia		P value*
	Mild-moderate	Severe	
BMI Normal	31	8	0.242

Obese	18	9
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*Analyzed using Chi's square method

Table 3. Analysis of the association between risk factors with the severity of androgenic alopecia in men.

Risk Factor	Grade severity of androgenic alopecia		P value*
	Mild-moderate	Severe	
Family History	18	10	0.112
Hypertension	9	2	0.529
Smoking	23	4	0.91
Type 2 diabetes melitus	2	1	0.759

IV. DISCUSSION

The studies that study the relationship between BMI and the severity of androgenic alopecia in men are still limited. There are studies that find a significant relationship and some also find a relationship that is not significant. Some studies found that there are no significant relationship between BMI and the severity of androgenic alopecia. Su and Chen¹⁰ found that the increased severity of androgenic alopecia was not associated with an increase in BMI ($p = 0.63$, $n = 740$). Then the study was conducted by González-González *et al.*⁷ found that there is no significant relationship between IMT and subjects with androgenic alopecia (28.7 kg/m^2 , $n = 80$) with IMT on a healthy subject (27.3 kg/m^2 , $n = 80$). Nabaie *et al.*¹⁹ comparing men with early onset of androgenic alopecia ($n = 97$) with men without androgenic alopecia ($n = 87$) who both had BMI above 30 kg/m^2 did not show a significant relationship ($p < 0.62$). While the research conducted by Yang *et al.*⁵ states that there is a significant relationship between BMI and the severity of androgenic alopecia ($p < 0.01$).

Until now there has been no study that could explain the relationship of BMI with androgenic alopecia in men. Possible related explanations are the pathophysiology of androgenic alopecia in which an increase in dihydrotestosterone levels is triggered by an increase in the level of 5α -reductase type II in men.^{11,13,14} The cause of the increase in type II 5α -reductase which is known to date is insulin resistance. Insulin resistance is thought not to occur in the subject of this study. Another possibility is an increase in the hormone itself, dihydrotestosterone. The increase in testosterone also affects the levels of dihydrotestosterone. But the fact is that testosterone and dihydrotestosterone levels are actually low / normal in obese men.^{11,12}

We also suggest that each risk can not contribute alone in increasing androgenic alopecia severity. But the family history itself can determine the severity of androgenic alopecia⁶ although it was not significant. Some subjects with negative results of fathers who suffer from androgenic alopecia reported have positive results of maternal androgenic alopecia grandfathers. This concludes that mothers carry the career genes of androgenic alopecia. Other risk factors such as smoking also doesn't contribute alone in increasing the severity of androgenic alopecia. We also found that some of the quitted-smokers and non-smokers also have a high severity of androgenic alopecia.^{20,21} This concludes that each of the risk factors can't contribute alone in increasing the severity of androgenic alopecia.

V. CONCLUSION

No association between body mass index and severity of androgenic alopecia in men. We hope further research able to explain the relationship between BMI and the severity of androgenic alopecia in men. Family history alone maybe can contribute alone in increasing the severity of androgenic alopecia, but obesity and other risk factors can contribute together to increase the severity of androgenic alopecia.

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Exclusionary Rules Of Evidence: Hearsay Rule And Its Exceptions In Nigeria

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Abstract- The law of evidence comprises the rules and legal principles that govern the proof of facts in a legal proceeding. These rules determine what evidence that should or should not be considered by the court in reaching its decision. The law of evidence also concerns with the amount, quality and type of proof required to prevail in litigation. However, in a criminal matter, there are a number of issues which either the prosecutor or the defence will have to prove in order to persuade the court to find in their favour. The law must therefore ensure certain guidelines are set out in order to make certain that the evidence adduced before the court is reliable. The most important of the rules of evidence is that, generally, hearsay evidence is inadmissible. However, there are certain exceptions to this rule under the Nigerian Evidence Act of 2011. The obvious one is the dying declaration. The aim of this paper therefore is to give an overview of hearsay rule, its exceptions and applicability in Nigeria with particular consideration of dying declaration. The paper finds that the modern formulation of the hearsay rule emphasis that it operates only on out-of-court assertions and only where such an assertion is tendered for a particular purpose. The paper concludes that there are several exclusionary rules under which the courts will not accept certain matters as evidence of a fact.

Index Terms- Dying Declaration, Evidence, Exclusionary Rule, and Hearsay

I. INTRODUCTION

Criminal justice as a vital institution of the society plays a significant role in protecting public order and maintaining security and justice. Law of evidence constitutes an integral part of the criminal justice system. It plays a crucial role in conviction or acquittal of the accused. In the common law doctrine, the law of evidence is determined as the law, which regulates the generation, collection, organization, presentation and evaluation of information for the purpose of resolving disputes about past events in legal adjudication. The law of evidence governs the fact finding procedure and the process of proof of guilt or innocence during the hearings in court.

It consists of the rules and principles applied by courts in the process of facts finding at a trial. The evidence of a fact that tends to prove an inference is called admissible evidence. There are several exclusionary rules, under which the courts will not accept certain matters as evidence of a fact. However, this paper intends to treat briefly only one of those exclusionary rules: Hearsay Rule and its exceptions (Another innovation in the new Act is that unlike the old Act, hearsay is now specifically defined and made inadmissible in accordance with established legal principles.)

This paper is divided into four brief parts. The first part deals with clarification of concepts, while part two relates to relevancy. Part three explores hearsay evidence. Part four concerns dying declaration and the conclusion follows.

PART ONE Clarification of concepts Evidence

According to Akinola Aguda, evidence is the means by which facts are proved but excluding inferences and arguments. The learned author stated as follows:

It is common knowledge that a fact can be proved by oral testimony by persons who perceived the fact or by the production of documents or by the inspection of things or places-all this will come within the meaning of judicial evidence. On a very broad view, it is sometimes, permissible to include in this list such other means of proving a fact as admissions and confessions, judicial notice, presumptions and estoppels¹

The Black's Law Dictionary defines the word evidence as: Any specie of proof or probative matter, legally presented at trial of an issue, by the act of the parties and through the medium of witnesses, records, documents, concrete objects, etc., for the purpose of inducing belief in the minds of the court or jury as to their contention.²

Any matter of fact that a party to a law suit offers to prove or disprove an issue in the case is known as evidence. It is a system of rules and standards that is used to determine which facts may be admitted, and to what extent a judge or jury may consider those facts, as proof of a particular issue in a law suit.³

Evidently, evidence, during trial proceedings in the courts is taken during the course of interrogation of a person on oath or affirmation. The evidence of the witness is obtained by oral

¹ Akinola Aguda, *The Law of Evidence in Nigeria* (1974), p. 11

² *Black's Law Dictionary*, p. 656

³ Evidence-Legal definition of evidence, available at <http://legal-dictionary.thefreedictionary.com/evidence>, accessed 1 October 2019

examination called the examination-in-chief. The witness is then examined on behalf of the opposite party in order to diminish or dismantle the effect of his evidence, under what is called, cross-examination. The party calling him in order to give an opportunity of explaining or contradicting any false impression produced by the cross-examination again examines him. This is called re-examination and it is necessarily confined to matters arising out of the cross-examination.⁴

This pattern of eliciting evidence in Nigeria's courts follows whether the suit is civil or where there is accusation of a crime under a charge or information.⁵

The law of evidence in Nigeria is governed by the Evidence Act, 2011. It came into force on the 3rd day of June, 2011. It repealed the Evidence Act Cap E14 by its section 257. According to its long title, the Evidence Act, 2011, is an "Act to repeal the Evidence Act Cap E14, Laws of the Federation of Nigeria and enact a new Evidence Act which shall apply to all judicial proceedings in or before courts in Nigeria and for related matters."

As the Code of Nigerian law of evidence, the Evidence Act, 2011 contains a complete system of law upon the subject of evidence as applicable in judicial proceedings before courts in Nigeria subject to the exclusionary provisions contained in section 256(1) (a), (c), (d), and (2) thereof.⁶

Exclusionary Rule

The law of evidence deals with the legally acceptable means of proving or disproving the facts in issue and standard of proof required in any particular case. It means that the law of evidence also excludes certain facts from being proved or disproved. It is exclusionary in nature.⁷ In Nigeria, the exclusionary rule is a legal right, based on constitutional law, saying that evidence collected or analyzed in violation of the defendant's constitutional rights is inadmissible for a criminal prosecution in a court of law. The exclusionary rule may also in some circumstance be considered to flow directly from the constitutional language such as the 1999 Constitution's command that "no person who is tried for a criminal offence shall be compelled to give evidence at the trial" and that "every person has a right to life, and no one shall be deprived intentionally of his life, save in execution of the sentence of a court in respect of a criminal offence of which he has been found guilty in Nigeria".⁸

The rule is occasionally referred to as a legal technicality because it allows defendants a defence that does not address whether crime was actually committed.

Accordingly, Professor Glanville Williams writing on the exclusionary rules of the law of evidence stated as follows:

The common law of evidence is distinctive chiefly in the determined way in which, although logically relevant, is regarded as unfair, or as dangerously misleading. The two chief examples of this exclusion are hearsay evidence and evidence of the accused's bad character.⁹

⁴ P.G., *Concise Law Dictionary*, p. 104

⁵ I.A.Umezulike, *Recording of Evidence and Judgment Writing, in Essays in Honour of Professor C.O.Okonkwo*, in E.S.Nwauche and F.I. Asogwa (eds) (PortHarcourt: Jite Books, 2000), p. 273

⁶ Z.Adangor, *What is Innovative in the Evidence Act, 2011?*, *Journal of Law, Policy and Globalization*, Vol. 43,2015, p. 36

PART TWO

Relevance

The most important factor in determining whether a piece of evidence is admissible is its relevance to the proceeding. Relevant evidence includes any evidence that would make the existence of a material fact more probable or less probable than it would be without the evidence.

In every jurisdiction, Nigeria inclusive, based on English common law tradition, evidence must conform to a number of rules and restrictions to be admissible. Evidence must therefore be relevant-that is, it must be directed at proving or disproving a legal element. As a general rule, relevant evidence is admissible while evidence deemed irrelevant is not.¹⁰ Basically, there are two types of relevance: Factual relevance: does the evidence make a fact in issue more or less likely to be true and Legal relevance: is the evidence directed at a matter in issue in the case? Does it help to resolve a fact that must be proved to establish the offence/charge? Or is it relevant to a fact lying outside the fact that must be proved to sustain/defend against the cause of action?

Relevant evidence will be excluded where there are concerns with:

(1) Reliability-evidence not reliable where it has the potential to distort the fact finding function of the court, or if it may cause the judge to reason irrationally or inappropriately

(2) Trial efficiency-does the evidence lead the trial down a side alley, or is it only marginally relevant

(3) Fairness-excluded where it may unfairly surprise the other party

(4) Privilege-excluded to foster certain relationships protected by confidential communication

(5) Exclusionary discretion-judicial discretion to exclude where the probative value out weighted by prejudicial effect

Therefore, even if the evidence is deemed relevant by a judge, it could be excluded if the possibility that it would confuse the judge and is unfairly prejudicial to the defendant. In the process of excluding evidence, some basic questions to be considered include:

(a) Is the evidence relevant?

(b) Is it factually relevant?

(c) Is it materially/legally relevant?

(d) Is the evidence admissible on the ground of law?

PART THREE

Hearsay Evidence

Introduction

Before the advent of British rule, and consequently the establishment of English style of court in Nigeria, adjudication of disputes was carried out ranging from informal family or village councils to customary courts presided over, in some cases, by

⁷ Afe Babalola, *Law and Practice of Evidence in Nigeria* (Ibadan: Sibon Books Ltd, 2001), p. 1

⁸ Sections 33 and 36 of the Constitution of the Federal Republic of Nigeria, 1999, as amended

⁹ *The Proof of Guilt*, 1963, p. 195

¹⁰ See generally, PARTS II and III of the Evidence Act, 2011

traditional rulers.¹¹ Although these courts dispensed justice fairly and impartially and always preferred live testimonies to secondary evidence, there was no technical rule prohibiting hearsay evidence. With colonization, came the introduction of English mode of courts and the extension of English common law doctrines of equity to the country.¹² An incidence of this colonial nexus was the adoption in Nigeria, of English common law evidence. By that fact, the hearsay rule became applicable in Nigeria.

Nigeria has detailed rules of evidence which regulate what facts that court may receive in the adjudication of disputes brought before it. The hearsay rule is one of such rules. It is essentially one of exclusion of evidence. It is an old principle having its root in the common law and is a feature of the evidentiary process of Nigeria. The rule has been regarded as one of essential features of the basic common law principle that a trial, especially in criminal case, should be based on evidence given by live witnesses in open court subject to cross examination. The provision of section 126 (a), (b) and (c) of the Evidence Act, 2011, provides inter alia, that "oral evidence must, in all cases whatever, be direct". The essence of this provision is to the effect that hearsay evidence is inadmissible in Nigerian courts.

What is hearsay Evidence?

Hearsay is one of the largest and most complex areas of the law of evidence in common law jurisdiction. The default rule is that hearsay evidence is inadmissible. Hearsay is an out of court statement offered to prove the truth of the matter asserted. A party is offering a statement to prove the truth of the matter asserted if the party is trying to prove that the assertion made by the declarant (the maker of the out of the trial statement) is true.

It is defined simply as any statement made outside of court that is offered in evidence to prove the truth of the matter asserted. The statement may be oral or written, or it may be non-verbal conduct intended as an assertion, such as pointing to a crime suspect in a police line-up. It is generally inadmissible, since the judge is unable to form an opinion regarding whether the person making the out-of-court statement is reliable. It is the testimony by a witness of what other persons have said, not what he or she knows personally. It is a statement which is not made by a person while giving oral evidence in a proceeding and which is to be tendered as evidence of the matters stated. The general exclusionary rule of hearsay evidence is that such testimony is no evidence.¹³ In other words, hearsay are assertions of persons, who are not called as witnesses, made out of court in which they are

being tendered for the purpose of proving the truth or falsity of the facts contained in the assertions (oral or written).¹⁴ Under section 37 of the Evidence Act, 2011(b) hearsay evidence, oral or documentary, is inadmissible and lacks probative value.¹⁵

An eminent scholar, and one of the earliest writers on the subject of evidence, Stephens, formulated the hearsay rule thus:

A statement oral or written made otherwise than by a witness in giving evidence, and statement contained or recorded in any book, document or record whatever, proof of which is not admitted on other ground, are deemed to be irrelevant for the purpose of proving the truth of the matter stated.¹⁶

Phipson's Law of Evidence perceives the matter this way: "oral or written statements made by persons who are not parties and are not called as witnesses are inadmissible to prove the truth of the matter stated.¹⁷ It is an assertion other than one made by a person while giving oral evidence in the proceedings is admissible as evidence of any fact or opinion asserted.¹⁸

Whether the statement is a hearsay statement, the focus is on the purpose or use of the statement rather than the mere fact that the statement was made out of court. If the only relevance of the statement is the truth it asserts, it is a hearsay statement. Where, however, if the statement is relevant for some purpose other than the truth of their contents, it is not a hearsay statement. For example, evidence of out of court statements offered merely to show that the statement was made, it is not a hearsay statement. Such "state of mind" evidence may be admissible to explain the state of mind, knowledge or emotion of the hearer (the witness) or the speaker (the maker).¹⁹ On the other hand, if the hearsay rule is treated as a restricting, not the admission, but rather the use of relevant utterances, the admission of an out of court assertion is not the end of the matter. The question of the intended and lawful use of the assertion remains to be subject of the argument or concession, ruling by the judge, and if there is a jury, a direction of the judge to the jury.²⁰

Definition and Statement of the Rule of Against Hearsay Evidence

Unlike the Evidence Act, Cap. E14 which did not contain any specific or explicit provision on the inadmissibility of hearsay evidence in judicial proceedings or even a reference to the term, "hearsay evidence", the Evidence Act, 2011 contains two substantive provisions dealing specifically with hearsay evidence.²¹

Section 37 provides-

"Hearsay means a statement-

¹¹ T. Akinola Aguda, *The Law of Evidence*, 1989 (3rd ed), p. 3

¹² This was done through reception of statutes; e.g. Ordinance No. 3. Of 1863; Interpretation Act, Cap. 89, Section 45 High Court of Eastern Region No. 27 of 1955; High Court Law of Northern Region No. 8 of 1955; Law of England (Application) Law of Western Region Cap. 60, Western Region High Court Law

¹³ National Open University School of Law, Course Code, Law II, Law of Evidence

¹⁴ Ibid

¹⁵ See *Buhari v. Obasanjo* (2013) NWLR (pt. 941) 1 at 317; *Doma v. INEC* (2012) All FWLR (pt. 628) 813 at 829; *Okereke v. Umahi & Ors* (2016) LPELR 40035 (SC)

¹⁶ *Digest of Law of Evidence*, Article 15

¹⁷ *Phipson's Law of Evidence* (10ed), p. 271

¹⁸ C.Tapper, *Cross on Evidence* (7th ed), 1990, p. 509

¹⁹ Evidence Law Summary; available at www.lawschool.co.nz Accessed 3 October 2019

²⁰ Philip McNamara: The Canons of Evidence-Rules of Exclusion or Rules of Use? In *The Adelaide Law Review*, 2009, p. 350

²¹ See *Ojiako v. State* (1991) 2 NWLR (pt. 175) 578 at 584; *Ajiboye v. State* (1994) 8 NWLR (pt. 364) 587 at 600; *Umeh v. State* (1992) 2 NWLR (pt. 223) 257 at 272-283; *Onuoha v. State* (1995) 3 NWLR (pt. 383) 591 at 598

a. Oral or written made otherwise than by a witness in a proceeding; or

b. Contained or recorded in a book, document or any record whatever, proof of which is not admissible under any provision of this Bill, which is tendered in evidence for the purpose of proving the truth of the matter stated in it.”

Section 38 provides that –

“Hearsay evidence is not admissible except as provided in this part or by or under any other provision of this or any other Act”.

Sections 37 and 38 have no equivalent provisions in the repealed Act and are a codification, by the law maker, of established judicial stance on the meaning and inadmissibility of hearsay evidence.²² Section 38 of the Evidence Act defines the word, “Hearsay” while section 38 of the same Act provides that hearsay evidence is not admissible.

Sections 37 and 38 of the 2011 Act were specifically applied and interpreted by the Court of Appeal in the cases of *Uweh v. State*²³ and *Magaji v. Ogele*²⁴. From the provisions, it is clear that whether the evidence of a statement oral or written, by someone other than the witness testifying in the course of proceedings before a court of law, is inadmissible as hearsay evidence, depends on the purpose for which the evidence is given or tendered by the witness. It is hearsay evidence and therefore inadmissible if tendered or given to prove the truth of the facts asserted as provided by the above provisions of the two sections of the Evidence Act. It is not hearsay and therefore admissible in evidence if it is only intended to be used to show simply, the fact that it was made.

Thus, in the case of *Utteh v. State*²⁵, the Supreme Court of Nigeria quoted with approval, the judgment of the Privy Council in *Subramanian v. Public Prosecutor*²⁶, where the rule was expressed as follows:

Evidence of a statement made to a witness by a person, who is not himself called as a witness may or may not be hearsay. It is hearsay and inadmissible when the object of the evidence is to establish the truth of what is contained in the statement. It is not hearsay and is admissible when it is proposed to establish by the evidence, not the truth of the statement, but the fact that it was made.

The point was made more clearly by the Privy Council in *Ratten v. The Queen*²⁷ thus:

The mere fact that evidence of a witness includes evidence as to words spoken by another person who is called is no objection to its admissibility. Words spoken are facts just as much as any other action by a human being. If the speaking of words is a relevant fact, a witness may give evidence that they were spoken.

A question of hearsay only arises when the words spoken are relied on testimonially, i.e. as establishing some fact narrated by the words...

The judicial accepted definition of hearsay in Nigeria is evidence of a statement made to a witness by one who is not himself called as a witness and which is offered to prove the truth of the statement.²⁸ In another case of *Osho v. State*²⁹, it was defined as a piece of evidence, if it is evidence of the content of a statement made by a witness who is himself not called as a witness. In yet another recent case of *Federal Republic of Nigeria v. Usman*³⁰, it was held that “it is secondary evidence of an oral statement best described as second hand evidence”. It was further held that “if a witness testifies on what he heard some other person say, the evidence is hearsay”.

Notwithstanding the narrow confines of section 37 of the Evidence Act, 2011, the courts extend hearsay to statements contained in documents.³¹

It is also interesting to note that unlike the position under the repealed Evidence Act wherein the exclusion of hearsay evidence in judicial proceeding was not explicitly stated, but rather inferred from the combined provisions of sections 77 and 79 of the Act, section 38 of the Evidence Act, 2011, explicitly codifies the general rule of exclusion of hearsay evidence in all judicial proceedings to which the Act applies. Thus, by virtue of section 38 of the Evidence Act, “hearsay evidence is not admissible except as provided in this Part or by or under any other provision of this or any Act”.³² It is clear from a literal interpretation of this provision that the admissibility of hearsay evidence is permissible either under the Act itself or by virtue of the provisions of any other Act of the National Assembly.³³ Thus, the statement of exclusion of hearsay evidence under section 38 of the Evidence Act, 2011 is subject to exceptions provided in the Act or any other Act of the National Assembly.

Rationale for the Prohibition against Hearsay Evidence

It cannot be asserted that hearsay is viewed with suspicion in Nigeria like other common law countries. This is due largely to the fact that it is less reliable than live testimony.³⁴ However, critics canvass that the theory that hearsay evidence is inherently weak and untrustworthy is spurious and a legal fiction and that current doctrine of exclusion cannot wholly be justified on the basis of a preference for live testimony. They point to the fact that several of the exceptions, to the rule, do not require proof of unavailability of the declarant.³⁵ Others argue that although hearsay may give inaccurate information, it does not give misinformation.³⁶

²² See *Olalekan v. State* (2001) 18 NWLR (pt. 746), p. 793; *JAMB v. Orji* (2008) 2 NWLR (pt. 1072)

²³ (2012) LPELR 19996 (CA)

²⁴ (2012) LPELR 9497 (CA)

²⁵ (1972) 2 SC SCNJ (pt. 1), p. 189

²⁶ (1956) 1 WLR, p. 969

²⁷ (1972) AC 378

²⁸ See *Abadon v. The State* (1997) 1 NWLR (pt. 479) 1 CA;

Nwoobosi v. A.C.B. Ltd (1995) 6 NWLR (pt. 101), p. 625 SC

²⁹ (2012) 8 NWLR (pt. 1320), p. 1

³⁰ (2012) 8 NWLR (pt. 1301), p. 141

³¹ *Armel Transport Ltd v. Martins* (1970) 1 All NLR 27

³² Z.Adangor, op. cit

³³ Ibid

³⁴ Christopher B. Mueller, Post Modern Hearsay Reform: The Importance of Complexity, *Minn. L.Rev.* 367, 341 (1992)

³⁵ Paul Milch, Hearsay Antinomies: The Case for Abolishing the Rule And Starting Over, 71 *Or. L.Rev.* 723, 745-769 (1992)

³⁶ Ibid

Yet all seem to agree that the perceived weakness of hearsay evidence derives its susceptibility to what are now known as the four hearsay dangers.³⁷ These are the risks of faulty perception, faulty memory, ambiguity and insecurity.

According to Olakanmi³⁸, the rationale for the rule of Hearsay is as follows:

1. The unreliability of the original maker of the statement who is not in court and not examined;
2. The depreciation of the truth arising from repetition;
3. Opportunities for fraud;
4. The tendency of such evidence to lead to prolonged inquiries and proceedings, and
5. The admission of hearsay evidence tends to encourage the substitution of weaker for stronger evidence.

However, in order to eliminate these dangers, there are some safeguards put in place to sift evidence and diminish, if not totally to eliminate them. The absence of these safeguards is regarded as the reason for the rule against the admissibility of hearsay evidence. The safeguards are oath, cross-examination and demeanor among others.

Safeguards to eliminate dangers of hearsay³⁹

Oath

In Nigeria, oral evidence in court is to be on oath or affirmation.⁴⁰ The underlying reason for the administration of oath is that it will induce the witness to speak the truth because a false testimony would earn them punishment in the world beyond. Similarly, since the giving of false testimony upon oath is an offence of perjury in Nigeria, the fear of prosecution and consequent punishment would reinforce the need for a witness to speak the truth. It therefore has a temporal and spiritual basis. Oath is an answer to the damages of fabrication.

However, oath as a stimulus to tell the truth has some doubt. Morgan notes:

What happened comparatively early to the oaths of compurgators has now unfortunately happened to the oaths of a witness. The deliberate expression by a witness of his purpose to tell the truth by a method which is binding upon his conscience probably still operates as some stimulus to tell the truth, but fear of punishment by supernatural forces for violation of an oath is generally regarded as virtually non-existent, and the threat of punishment has little effect.⁴¹

Cross Examination

³⁷ Michael Seigel, Rationalizing Hearsay: A Proposal for A Best Evidence Hearsay Rule, 72, *BU L. Rev.* 893, 909-910 (1992)

³⁸ Jide Olalekan, *Evidence Act 2011, Cap. E 14: Synoptic Guide* (Abuja: LawLords Publication, 2011), p. 132

³⁹ See generally, Lawrence O. Azubuike, Hearsay Evidence: A Comparative of Two Jurisdictions: United States and Nigeria, Thesis and Essays; also available at http://digitalcommons.law.uga.edu/at_11m/192 accessed 10 October 2019

⁴⁰ See section 205 of the Evidence Act, 2011

⁴¹ Edmund Morgan, Hearsay Damages and The Application of the Hearsay Concept, 62 *Harvard L. Rev.* 177, 179 (1948)

A significant feature of the adversarial process of litigation obtainable in Nigeria is the right of an opponent or adversary to cross examine any witness called by the other party. A significant feature of the adversarial process of litigation obtainable in Nigeria is the rights of an opponent or adversary to cross examine any witness called by the other party. Section 214 (2) of the Evidence Act, 2011, defines cross-examination as “the examination of a witness by a party other than the party who calls him” From a tactical perspective and in terms of its ultimate objective, cross-examination is more than mere interrogation; it is essentially a process of questioning designed to produce materials or evidence, which the counsel cross-examining will require in his address to discredit the version of the facts presented by the other side and present his own version as more credible.⁴²

According to Wigmore:

The theory of hearsay rule is that many possible deficiencies, suppressions, sources of error and untrustworthiness which lie underneath the bare untested assertion of a witness, may be best brought to light and exposed by the test of cross examination.⁴³

Many scholars see cross examination as a “security for correctness and completeness of testimony”⁴⁴ and as the best all embracing reason for the exclusion of hearsay evidence.⁴⁵

As a safeguard against the four dangers, cross examination discloses:

all data helpful to the trier in determining (1) what information the witness intends to convey to the trier by the language he uses (2) the belief of the witness in the truth of his testimony, that is his sincerity (3) the extent to which what the witness purports to remember is the product of memory or of some other mental process such as reconstruction or the mistaken adoption as his own of the experience of another and (4) the extent to which what the witness testifies that he perceived corresponds to what was then and there open to his observation or capable of being perceived.⁴⁶

When evidence is put through the crucible of cross examination, the judge would be able to properly evaluate it and to ascribe the appropriate weight to it. The idea is that if the witness misperceived the facts, cross examination will reveal this. If his memory of the fact is defective, this will also be apparent upon proper cross examination. And if his language is ambiguous,

⁴² Fola Arthur-Worrey, Cross-Examination-Basic Principles and Techniques in Criminal and Civil Trials, being a paper presented at NIALS/CWAG Workshop on Oral Advocacy in Nigeria, holding at the Nigerian Institute of Advanced Legal Studies, Lagos, May 10th-12th, 2017

⁴³ 5 Wigmore, *Evidence*, s. 1370 (Chadbourn rev. 1974)

⁴⁴ John William Strong (ed) McCormick on Evidence (1992) citing *Gibbons v. State*, 248, Ga 851, 286 (1982); *State v. Copeland*, 287, SC, 300 sc (1982)

⁴⁵ Michael M. Martin, *Basic Problems of Evidence*, 299 (6ed, 1988)

⁴⁶ Edmund Morgan, *Some Problems of Proof under the Anglo-American System of Litigation*, 142-143 (1956)

in cross examination, he might clarify the meaning which he intends by his evidence.⁴⁷

In Nigeria, an effective cross examination will give away an insincere witness. After all, the cross examiner has very wide latitude. E.g. under the Nigerian Evidence Act, he can ask the witnesses any question among others:

- a. To test his accuracy, veracity, or credibility; or
- b. To discover who he is and what his position in life is;
- c. To shake his credibility by injuring his character
- d. To weaken or destroy examination-in-chief
- e. To obtain evidence that will assist the party's own case by the testimony of the opponent's witness

According to the Supreme Court in the case of *Omisore v. Aregbesola*⁴⁸, cross examination is a vital tool for perforating falsehood if properly employed.

There is no doubt that cross examination is an important safeguard. As Morton notes, it does not ensure that evidence is reliable but "merely expresses the sources of unreliability and provides a basis for evaluating testimony and determining how reliable it is.

Demeanour

By demeanour is meant the comportment of the witnesses while giving evidence. The argument is that solemnity of the court scenario and the publicity of disgrace, coupled with the presence of the adversary will deter falsehood and intimidate witnesses to tell the truth.

As Mueller and Kirkpatrick noted, many mannerisms and human qualities come into the comportment of the witness and an assessment of these points enable the trier of facts to assess credibility and meaning.⁴⁹

The trial judge will consider whether the witness is comported or fidgeting. What is his facial expression? How does this witness generally carry himself? All these and more have a bearing on whether the witness is telling the truth. They also help the judge to evaluate the evidence. Where a witness narrates what an act of declarant said, the judge is deprived of the opportunity to observe the out of court declarant, who is really the witness, the other merely being his conduit for transmitting the testimony. This deprivation impacts on the evaluation of the evidence. The trial of facts will thereby not have all the facts necessary for him to assess the evidence and ascribe weight to it. This is yet another important concern of Nigeria which leads to it as it were, view hearsay with suspicion.⁵⁰

Exceptions to the Hearsay Rule

At common law, former statements of any person whether or not he is a witness in the proceedings, may not be given in evidence, if the purpose is to tender them as evidence of the truth of the matter asserted in them, unless there were made by a party to those proceedings and constitute admissions of fact relevant to those proceedings⁵¹. An important innovation is contained in

Section 39 of the new Act, wherein, unlike Section 33 of the repealed Act, which limited the admissibility of statements made by persons who cannot be called as witnesses **only to dead persons**, the scope is now extended to:

- (a) Persons who cannot be found;
- (b) Persons who have become incapable of giving evidence; or
- (c) Persons whose attendance cannot be procured without an amount of delay or expense which under the circumstances of the case appears to the court unreasonable

The Evidence Act⁵² makes provisions for admission of evidence of certain hearsay statement of relevancies under specified conditions. In other words, if the statement is not hearsay, it is admitted. However, if it is hearsay, it is presumptively inadmissible unless it fits with the categorical exceptions as enumerated under sections 1-4, and 39-65 and 83 of the Evidence Act, 2011.

However, according to section 126 of the Evidence Act, 2011, the general rule is that oral evidence must be direct; and except the content of documents, all facts may be proved by oral evidence. It provides as follows:

126. Subject to the provisions of Part III, oral evidence shall, in all cases whatever, be direct if it refers to-

- (a) a fact which could be seen, it must be the evidence of a witness who says he saw that fact
- (b) to a fact which could be heard, it must be the evidence of a witness who says he heard that fact;
- (c) to a fact which could be perceived by any other sense, or in any other manner, it must be the evidence of a witness who says he perceived that fact by that sense or in that manner;
- (d) if it refers to an opinion or to the grounds on which that opinion is held, it must be the evidence of the person who holds that opinion on those grounds

This provision therefore makes hearsay evidence inadmissible.⁵³ The rule against hearsay consists of two separate rules:

- a. The rule requiring evidence to be 1st hand: This rule demands that evidence must be given by the percipients, because of the risk of the evidence being altered as it passes from one witness or potential witness to another.
- b. The rule requiring evidence to be given orally in court: This presupposes that evidence must be given in the witness box, because of the importance attached to the oath and to giving the opposing party or parties the opportunity to cross examine.

The common law principles of evidence are commonly expounded on the footing that they are dominated by rules of exclusion of evidence. However, on the other hand, how does one place the inclusionary principle that all information sufficiently relevant to the facts in issue at a trial is not only admissible but positively required to be admitted if elicited in proper form from a competent witness and for a proper purpose? The hearsay rule has therefore become the most difficult rule of common law of evidence to explain, justify and defend because it clearly can

⁴⁷ Lawrence O. Azubuike, Hearsay Evidence: A Comparative of Two Jurisdictions: United States and Nigeria, Thesis and Essays, op. cit

⁴⁸ (2015) 15 NWLR (pt. 1482), at p. 223

⁴⁹ Lawrence O. Azubuike, op. cit footnote 47

⁵⁰ Ibid

⁵¹ Phipson on Evidence, op. cit footnote 17

⁵² Evidence Act, 2011, op. cit

⁵³ See *Subramaniam v. Public Prosecutors*, op. cit

operate to prevent the use of reliable relevant information. Due to the mere fact that hearsay rule excludes evidence irrespective of its reliability and relevance; it has some of the trappings of an absolute rule of exclusion.⁵⁴ The point was made even more clearly by the Privy Council in the case of *Ratten v. The Queen*:⁵⁵ The mere fact that evidence of a witness includes evidence as to words spoken by another person who is not called is no objection to its admissibility. Words spoken are facts just as much as any other action by a human being. If the speaking of words is a relevant fact, a witness may give evidence that they were spoken. A question of hearsay only arises when the spoken words are relied on “testimonially”, i.e. as establishing some fact narrated by the words...

It should be noted that the hearsay rule operates on out-of-court rule assertions according to the purpose of the party tendering, not the purpose of the original speaker. Even out-of-court statements which, when uttered, had purely an assertive function can in theory be tendered to be used non-assertively and if tendered to be so used are not caught by the hearsay rule. If and only if the out-of-court assertion is tendered solely to be used testimonially, that is as a means of proof of what is asserted, is the tender objectionable.⁵⁶ If the out-of-court statement is tendered to be used as the basis for an inference to which it rationally gives rise whether it is true or false or if it is tendered merely to be used as a step in the unfolding of the drama which gave rise to litigation, or if it is tendered merely because it is part of the background necessary to set the stage, and so add life and colour to the narrative given by the witness, its tender cannot be objected to on the basis of hearsay rule. It can be counterproductive, unjust and, as Professor Cross has noted, dangerous in particular instances.⁵⁷ It is in view of this that some have argued that the rule has become so hamstrung with exceptions that it should in fact be the exception rather than the rule.⁵⁸ It is the writer's stand that no matter the observations on hearsay rule, in Nigeria; it has come to be an important part of the law of evidence. This may be contrary to the decision of Uwais, CJN (as he then was) in the case of *Utteh v. The State*⁵⁹ when he noted:

Happily the rule of evidence at common law is not applicable in Nigeria where the provisions of the Evidence Act specifically deal with a given situation-see *Jimoh Amoo & Ors. v. The Queen* (1959) 4 F.S.C 13 at p. 115; (1959) SCNLR 272. In the present case the evidence of PW2 is admissible by virtue of the provisions of sections 8, 76, 77 of the Evidence Act Cap. 112 to prove the fact of the statement made by Mr. Dante Noaro at the trial.

⁵⁴ See particularly, Philip McNamara, *The Canons of Evidence-Rules of Exclusion or Rules of Use?* In *The Adelaide Law Review*, 2002, pp. 348-353

⁵⁵ (1972) AC 378

⁵⁶ *Ladlow v. Hayes* (1983) 8 A Crim R 377, 382-383

⁵⁷ Cross On Evidence (2ed) 1982

⁵⁸ Faust F.Rossi, *The Silent Revolution*, 9 Litig. 13-17 (regarding the exclusion of hearsay as a fiction)

⁵⁹ (1992) 2 NWLR (pt. 223) 257

⁶⁰ Op. cit

According to Osinbajo, the above is susceptible to two possible interpretations. It could mean that the common law rule on hearsay is not applicable in Nigeria. With respect, that view would be correct to the extent that the Evidence Act has not incorporated the statement of the common law on hearsay as defined in the leading case of *Subramaniam v. Public Prosecutor*⁶⁰ directly into the Evidence Act. His Lordship's statement could also be interpreted to mean that the essence of the hearsay rule which is to ensure that a witness speaks only of facts which he had personally perceived with one of his five senses is not applicable in Nigeria...the essence of the provision of section 77 of the Evidence Act amongst others is to ensure that only direct oral evidence is given by a witness.⁶¹

Of all the exceptions enumerated above, the dying declaration as an exception will be briefly discussed:

PART FOUR **Dying Declaration**

Dying declaration is based on the Latin maxim, '*nemo mariturus praesumitur mentiri*'-literally translated, it means 'a man will not meet his maker with a lie in his mouth'. It originated in English law. As early as the 1720's, dying declaration was used as an exception to the hearsay rule and was admissible, provided it complied with certain legal principles set out under English common law.⁶² It is admissible only to prove the cause of death or the circumstances of the transaction leading to the cause of death of the declarant but not to prove motive for the crime or to explain subsequent or previous transactions. The declarant must have believed himself to be in danger of approaching death.⁶³ This principle was established in the Nigerian cases of *R. v. Ogbuewu*⁶⁴ and *Kuge v. The State*⁶⁵

It means statements made by a person who is lying at the point of death, and is conscious of his approaching death, in reference to the manner in which he received the injuries of which he is dying, or other immediate cause of his death and in reference to the person who inflicted such injuries or the connection with such injuries of a person who is charged or suspected of having committed them. In *Akpan v. State*⁶⁶, the Supreme Court on the statement made by someone on sick bed held as follows: "...it is well established in our law of evidence that a statement made by a person in imminent fear of death and believing that he was going to die is admissible as a dying declaration". It is a declaration of someone at the point of death, whose hope of life is gone, when the motive for falsehood is no longer there and the mind is

⁶¹ Yemi Osinbajo, Law of Evidence, in Niki Tobi (ed) in *Uwais Through The Cases* (Enugu: Snaap Press Ltd, 2006), p. 604

⁶² Sherika Maharaj, *Should the dead have a say in a matter?*, available at www.derebus.org.za, accessed on 10 February 2018

⁶³ See *R v. Bebetebe* (1938) WACA 67; *Mono Garba v. R* (1959) 4 JSC 152

⁶⁴ See *R v. Ogbuewu* (1949) 4 WACA 67

⁶⁵ (1969) NMLR 153

⁶⁶ (2016) LPELR-40012 (SC); see also: *Aknife v. The State* (1988) 3 NWLR (pt. 83), *Ajiboye v. State* (1994) 8 NWLR (pt. 364) 587 at 603

compelled by the most powerful consideration of the impending unknown to speak the truth.⁶⁷

It is also defined in section 40 of the Evidence Act as follows:

40 (1) A statement made by a person as to the cause of his death, or as to any of the circumstances of the events which resulted in his death in cases in which the cause of that person's death comes into question is admissible where the person who made it believed himself to be in danger of approaching death although he may have entertained at the time of making it hopes of recovery.

(2) A statement referred to in subsection (1) of this section shall be admissible whatever may be the nature of the proceeding in which the cause of death comes into question.

Rationale for this rule

In the case of *R v. Woodcock*⁶⁸, Eyre, C.B. stated the rationale for dying declaration thus:

The general principle on which the species of evidence is admitted is that they are declarations made in extremity, when the party is at the point of death and when every hope of this world is gone; when every motive of falsehood is silenced, and the mind is induced by the most powerful consideration to speak the truth; a situation so solemn and so awful, is considered by the law as creating an obligation equal to that when is imposed by a positive oath administered in a court of justice.

Thus, in the Nigerian case of *Rev. King v. State*⁶⁹, the Supreme Court held that dying declaration is an exception to the hearsay rule. It is a declaration made in extremity, when the maker is at the point of death, and every hope of life is gone. In this state, the motive to tell lies is silenced and the mind is induced by the most powerful consideration to speak the truth.

Applicability/admissibility of Dying Declaration

In application of the above section, the Supreme Court in the case of *Okebata v. State*⁷⁰, held that:

The law is trite that evidence of a dying declaration is a special specie of evidence. Where the court must rely on the account given by an eye witness who heard a dying declaration made by the deceased, strict proof is required of the dying declaration in the exact words used by the deceased. If the words used in the dying declaration are unclear, imprecise and not free from ambiguity, such a manifest contradiction would militate against its application.

Other factors to be satisfied when making reference to the statement made by a person before his death to be relevant are as follows:

A. The statement is made by a person who is conscious and believes or apprehends that death is imminent;

B. The statement must pertain to what the person believes to be the cause or circumstances of death;

C. what is recorded must be the statement made by the person concerned, since it is an exception to the rule of hearsay evidence

D. the statement must be confidence bearing, truthful and credible;

E. The statement must not be the one made on prompting or tutoring, and

F. The statement should not be prompted by any motive or vengeance.⁷¹

The applicability of dying declaration was explicitly made in the Nigerian case of *Osiekwe v. The State*⁷² thus:

1. The declarant must have died before the evidence of the declaration;

2. It is admissible only in trials for murder (capable homicide punishable with death or manslaughter (capable homicide not punishable with death), where the accused is alleged to have caused the death of the deceased/declarant;

3. The statement must contain some expressions of hope of recovery or doubt as to his death. That is, the deceased/declarant, at the time of making this declaration, must have believed himself or herself to be in danger of approaching death, although he may have entertained hopes of recovery. The trial judge is required to make a specific finding that the deceased did in fact believe in the danger of approaching death when making the declaration;

4. The statement must be made by the victim of the alleged crime (i.e. the deceased) and must relate to the cause of his/her own death;

5. The declarant must have been a competent witness if he or she were alive. The declaration must not be or include hearsay; it may include an opinion;

6. The declaration can be oral, or written or by signs;

7. Where the declaration is admitted, it must be complete. It is not competent to shift the parts that are favourable from those that are not

Dying declaration under the Evidence Act is very restrictive. It does not apply to civil cases and is still limited to homicide cases. And even at that, not all homicide cases deal with dying declaration; but to those involving death of a particular declarant and in which the cause or circumstance of the transaction leading to such death are in issue. Under the Federal Rule of Evidence of the United States, the declarant need not be dead. His declaration may be admitted in civil cases or in a homicide trial resulting from the death of another person. On the other hand, under section 40 of the Evidence Act, it applies only to where the particular declarant is dead and only in respect of a homicide trial resulting from his death.

The central consideration is the declarant's belief of impending death. The declarant simply believes in danger of approaching death.

⁶⁷ See *Orshin Kuse v. State* (1969) NMLR 153

⁶⁸ (1789) 1 Leach 500/ (1789) 168 ER 353

⁶⁹ (2016) LPELR 40046 (SC)

⁷⁰ (2013) LPELR 22474 (CA)

⁷¹ See further, Ingredients to be satisfied for relevancy of dying declaration; also available at <https://www.lawkam.org> Accessed 15 October 2019 ; also, see *Laxman v. State of Maharashtra*, AIR 2002 SC 2973

⁷² (1999) 9 NWLR (pt. 617) 43 at 68

The English law principles were set out in *State v. Gabatwaelwe*⁷³ where the court held that dying declaration is a statement that may be oral or written or taken in the forms of signs, or gestures. It needs not be made with the deceased dying words or dying breath.

II. CONCLUSION

The laws of evidence consist of the rules and principles applied by courts in the process of fact finding at a trial. The evidence of a fact tending to prove an inference is called admissible evidence. However, there are several exclusionary rules, under which the courts will not accept certain matters as

evidence of a fact. Overall, exclusionary rule is highly applicable under the Nigerian Law of Evidence.

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Social control: between theoretical analyzes of the past and future perspectives. The contribution of the theoretical criminological approach to the phenomenon

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Abstract- Social control has been, and continues to be, one of the most debated issues in the entire social sciences panorama. Still today one wonders what the objects of control can be, how they can be identified, labeled and, above all, kept on the margins. The problem is that, in most cases, there is no process and historical view of the reality in question: sociologists think of "social control" as a set of tools or intentional measures designed to correct, reintegrate, contain or restrain the minorities; this way of thinking tends to conceive society in general as if it contained two zones: a central sphere of more or less autonomous, self-governed, "responsible" subjects and a periphery of deviant under surveillance and control, whose access to the central sphere is monitored from different guardians (gate keepers) and whose identities are marked, at least in part, by their label of "deviants".

Index Terms- Deviance, society, conformity, norm.

I. INTRODUCTION

For several years, numerous scholars have been inclined to intertwine the study of deviant behavior with the study of social control. This is a very widespread approach (Cohen 1966; Cesareo 1979; Scull 1983) which does not exempt from the attempt to propose a specific definition of social control (control social, contrôle social, social control, soziale Kontrolle), because only the comparison between two distinct concepts analytically facilitate a proper evaluation of their complementarity. To speak of social control without risking falling into common sense analysis means, first of all, to set margins within which to elaborate reflection. It can be defined as a set of knowledge, powers, strategies and institutions through which the power elites preserve a particular social order, placed in a precise historical, contemporary moment, which gives specificity to the concept of normality and pathology. This happens thanks to the use of tools and strategies to reduce deviance, a breeding ground on which social control flourishes. How can we define normality, pathology and deviance, how to recognize it and analyze it? Durkheim (1969) in "The rules of the sociological method" recalls that normality, associated with common morality, is the average of behaviors: what is normal is such for a specific social type, at a given time and in a certain place (Durkheim also considers it a moral value) and that the normal type is that already realized and

given by the facts of the past. On the contrary, what questions the social order and the dominant values of the average population is considered pathological for that society at that time, in relation to the degree of development achieved. It is thus deduced that both the normal and the pathological are relative concepts, connected with the time and with the evolution of a particular society. Social changes imply a change in the dominant values, even within the elite itself, which modify the conditions of collective existence. What is pathological today for the social order may be necessary for the subsequent evolution of the social order itself. Analyzing control also means proposing it as a social fact and as such explaining it, using other social facts, without resorting to tautologies. Durkheim (1969) suggests that social facts are collective phenomena and exist independently of the individual's use of them, existed before him and exist outside of him, exist outside of individual consciousness, must be endowed with power coercive and imperative by virtue of which they impose themselves to the individual with or without his consent, even if they are perceived with "naturalness". When it conforms, coercion is not felt, but it is affirmed at the very moment in which it is tried to resist it. Social facts occur both in crystallized forms and in the form of social currents. Social control is therefore not a transcendent entity but a social fact; it is also the result of interaction, open to any bargaining, between individuals and how they define collective reality. Gurvitch (1997) in "Social Control" notes that what appears as "order" (normal) to a group of individuals can be considered "disorder" (pathological or deviant) by other elements of the same society. He also makes a distinction between species and forms of control. To the first belong the values connected to religion, morality, law, art, knowledge, education, to which the forms of social control according to the political structure of the specific society must be integrated and crossed, which vary from the form of control organized (both autocratic, democratic), to the spontaneous one implemented by collective experiences (including revolts and revolutions), to the control exercised with the help of cultural practices and uses and, finally, to the spontaneous one implemented by the ideas and collective ideals. The type of social control we will be dealing with is above all the first, the organized one, in a democratic political context.

From the social transformations linked to the transition from peasant society (self-referential with primary relations and forms of self-control entrusted to its own associates) to the industrial one

(characterized by a strong individual conscience and anonymity, by a set of different cultures and a high degree of conflict) where social control to be effective is delegated to state agencies) social control changes from self-centered to heterocentric. It has to do with the element of public order, a pact between associates that, unable to resolve particular conflicts, delegate the resolution to a third body, the State, collector of the interests of the associates; a sort of collective consciousness that is independent of its individual elements, a collective consciousness that prevails over individual consciousness. Emanation of the state body is the law: a set of codified norms born of interaction and bargaining between social subjects, which crystallize and do not allow arbitrary interpretations, becoming a consolidated social practice. Public order is different from security in that the first responds to the interests of the community while the second is inherent to the individual. Pitch and Ventimiglia (2001) argues that it is possible to distinguish objective safety, measurable with adequate tools free from prejudices and political orientations, from subjective security, perceived individually or collectively, which instead admits to being influenced by prejudices, emotions, cultural models. Furthermore, public order has to do with the national sphere, while security with the local area is a citizen. To exercise social control, and its implications in terms of security, models of deviant subjects are resorted to, pathologies within the society, on which to discharge the responsibilities of the collective disorder. Scapegoats of easy interpretation and historically replaceable that can serve to mask the real perversions of the imposed social order. The containment strategies of deviant phenomena consist in reducing the possibilities of behavior of individuals by determining constraints, which translate into techniques for detecting infringements and punishment. The space of action of the social actors is limited to a space that conforms to normality. It is possible to recognize as institutions of social control the total institutions like the prison or the mental hospitals but also the factories and the family. Also certain political choices produce more or less control both in intensity and in extension. These choices, acted through legislation, can produce deviance, or rather what the institutional apparatus and social constructions define as such (labeling theory). Deviance is not an act but the answer, the social definition of this act. From the deviance to its criminalization the step is short. But even here Durkheim (1969) recalls that what we call a crime is what society defines as such, born of collective feelings at a specific historical moment and protected by the criminal law linked to that moment.

The current free philosophy has had heretics as precursors, condemned by the secular arm of the church. We establish that a behavior is criminal because there is a penalty issued in a place established for this purpose, the court. In the penalty we find condensed the reference norms (what is crime and what is not) and also the moral references (what is right and what is wrong) characteristics of a particular society. Durkheim (1969) also argued that in societies with mechanical solidarity, the law is repressive because it excludes those who do not comply, while in organic solidarity the right is restorative because it does not fear the violation of the rules but the offense to contractual rights of individuals.

In the classic forms of social control, the disciplinary functions were attributed to the prison institution. The metaphor of the Panopticon by Bentham (1779) very effectively illustrates

the powers of control: to make the prison population believe they are continually observed and judged by the ubiquitous gaze of the controllers, protected instead by the looks of the prisoners, where no shortcoming could remain unpunished. From the early 1960s until the 1980s, new theories of deviance and its treatment loomed: investigating the causes that can determine deviant behavior by trying to provide a plausible sociological explanation. It is thought possible to eradicate deviance by intervening on the social causes that produced it. In this way prevention and treatment policies of problem situations are articulated and philosophies of social reintegration of prisoners are introduced. The penalty is transferred from the total institutions to the community and the socialization networks, where the society and its institutional ramifications take charge of it through professional knowledge. We can define this phase as welfare, where crime was presented as a symptom and not as a cause.

Gurvitch (1997) argues that social control can be functional to the reduction of antinomies operated by social groups, individuals or institutions, through a continuous dialectical process that aims at a higher and higher degree of development of society, respectful of the community and otherness. Social control organized and managed by the elite, proposed to the community as it is today, makes the hypothesis of Gurvitch utopian, helping to create feelings of extraneousness and states of conflict between increasingly evident social actors. According to Cohen (1969) there is no doubt that only rarely is an exhaustive discussion carried out about the nature, evolution and objectives of social control processes, also because it is much more immediate, as well as reductive, to consider them as a simple response to crime, endeavoring to construct, in this way, a general theory of deviant behavior, namely *“a set of propositions applicable to all the manifold empirical varieties of deviance, capable of accounting not only for deviation phenomena by identifying their motivations, correlates and the mechanisms that produce them in relation to the various regulatory situations and their control apparatus, but also of the particular forms that they assume in this or that socio-cultural context”*. The problem does not consist only in the limits of a general, all-encompassing theory of the reality in question, but rather in the fact that deviance is reduced to a simple deviation, that is to say a *“non-conformity to every normativised mode, be it a law, or a more or less consolidated social convention”*. The basic idea is related to the ability of standards to provide a subtrack for every human action and the deviation, at least potentially, represents a danger for social organization. Those who embrace this thesis are convinced that every type of society presents rules, rules, behavioral patterns whose violation provokes disapproval, anger or indignation. Not only: we are under the illusion that to be able to explain human behavior it is enough to know the circumstances that lead to observing and not observing the norms, without realizing that a simple dichotomous classification, far from allowing an understanding of human behavior, does not build a basis for a theory of deviance, but it is the background to a simple theory of conformity. It follows a very meager view of social control, considered as a simple set of structures that can prevent or reduce crime, *“something that prevents deviation, whatever this”* thing *“is prevention, punishment, the reform, justice, reparation, compensation, moral raising of the victim”*.

Most theoretical approaches do not, however, clarify the distinction, both conceptual and concrete, between social control

and deviance, due to the fact that they consider social control as a simple tool to punish and arouse fear, or because they are useful elements in a greater understanding is not even mentioned. It seems appropriate, in fact, to reflect on why it is necessary to consider social control in a procedural perspective, on why it is not possible to leave aside an historical analysis, on the thin border that separates the control processes from those of self-control. And again: one cannot speak of social control without mentioning the risks that a (presumed) pathological theory of social disorganization can entail, without referring to the implications that the processes of socialization can have in this regard, without taking into consideration the construction processes of identity, both individual and social, or even deceiving ourselves to reduce the entire analysis to the external coercivity of the institutions.

II. THE ANALYSIS OF THE RELATIONSHIP BETWEEN SOCIALIZATION AND SOCIAL CONTROL IN THE LITERATURE

Socialization encompasses a series of processes that are not only grafted onto information, or what concerns information in a given society, but also about people's attitudes, ideas; these processes structure certain types of actions and behaviors as well as basic categories of comprehension and classification in general (Watkins, 1975). This is why it is defined as the complete and coherent settlement of an individual in the objective world of a society or sector (Berger, Luckmann, 1969). Obviously, the ways in which all this happens are extremely variable. In other words, the universality of socialization processes does not imply the universality of tools and techniques (Watkins, 1975) with which social inclusion occurs. Socialization, therefore, is of great importance for a reflection on the processes of social control and on the ways in which they change certain aspects of American society between the end of the nineteenth century and the beginning of the twentieth century. We are faced with one of the best keys to understanding the phenomena of the social order and a topic that, like social control, opens up different analytical perspectives, also because the most important aspects to be emphasized concern emotional involvement and their implications in terms of personal image and identity (Watkins, 1975). Mead (1925) points out that "society" and "self" are part of the same process of "social interaction", "since the development of a "self", and following a firm "I", find their indispensable a premise in the specifically human ability to assume the attitude of the other, another that, in its most universal form, is "another generalized". Coser (1983) identifies in Mead the first author ever to have highlighted that the process of construction of the Self through the assumption of the perspective of the other constitutes the process of social control proper. In open contrast to behaviorist theories, Mead (1966) considers psychology as a discipline that studies the activity of individual behavior to the extent that it fits into the social process. The behavior of the individual, for his part, can be understood only when it is connected to the whole group to which he belongs, also because the individual acts are connected with larger acts, of a social nature, which go beyond him and which implicate the other members of that group (Mead, 1966).

III. THEORETICAL NOTES ON SOCIAL CONTROL AND THE CRIMINOLOGICAL ASSUMPTIONS FROM SUMNER TO QUIRON

Quiron (2001) pointed out that social control represents the set of processes that contribute to the internalization of norms, putting pressure on compliance. Less rhetorically, Robert (2000), underlines the traditional distinction that contemporary sociologists operate, namely that between socialization and the social reaction to deviance, therefore, between learning to conform and the elimination of non-conformity. The American Criminology is today oriented on the theme of the annulment of everything that does not appear to conform to the basic rules of officially constituted human groups. In this regard, Sumner (1997) and Melossi (1990) speak of a real "*sociological theory of the institutionalization of the discipline*". The whole of the twentieth century attempted to investigate the set of mechanisms that make social order possible. The central problem of society is that of making possible the union of human beings in the context of modernity (Park & Bugess, 1924). Ross (1901) qualifies the "social control" as a domination of men by other men, as happened in the relations between husband and wife within the patriarchal families. However, since the 1960s, European Criminology has begun to deepen the new aspect of "social reactions to deviance". With Robert (1984) and with Digneffè, Nachi and Perilleux (2002) we start to use terms such as surveillance, correction, verification, compliance, inspection. In the second half of the twentieth century, controlling society now means repressing violence, lack of respect and all that is contrary to public peace. Consequently, the State was and is obliged to apply Criminal Law with the utmost rigor, which is the main instrument for combating crimes and, above all, the illegitimate use of force.

With Parsons (1951), the idea of an absolutizing "social control", conceived to neutralize whoever is perceived, rightly or wrongly, as an enemy of peaceful collective coexistence, takes the field in US Criminology. Equal "zero tolerance" towards deviances is also bitterly described by Clark and Gibbs (1965), who bluntly denounce the sad story of the lack of distinction between anti-social behavior and, vice versa, anti-legal behavior in the technical sense. According to Parsons (1951), the person responsible for a crime provokes a real illness in the community and social control is configured as a set of mechanisms that counteract deviance, guaranteeing integration, or the exclusion of men. Social control reports who is becoming a deviant in the ranks of conformity, or expels the deviant outside the social group. Parsons (1951), however, is radical and preemptory, to the point of not distinguishing spontaneous socialization from the rigid and aggressive notion of "social control". It would be like denying that the child, as normal, tends to socialize spontaneously and forced corrections are certainly present, as well as indispensable, but do not constitute the standard-pivot of the pedagogical path. Finally, Parsons (1951) does not postulate any form of prevention and propaganda the social reaction in the same way as a remedy that intervenes after the commission of the crime. If this were the case, some basic criminological notions, such as deterrence, special-preventively and general preventive behavior, would no longer make sense. Cohen (1983) considers Parsons' retributory position (1951) to be too severe. Within a democratic-social order it is not admissible that "*deviants are separated by a whole range*

of practices: they are imprisoned, punished, corrected and educated differently by other people". In the grammar of separation, social control refers to the set of organized responses, such as punishment, deterrence, treatment and prevention towards people and behaviors judged as deviant, problematic, disturbing, threatening, difficult or otherwise undesirable (Cohen, 1983).

The criminological and institutional practice of the "separation of the good from the bad" was widespread in American Criminology, as shown by Ross (1901) and Park and Burgess (1924). The arrogance of a hypertrophic and omnipresent law manifests itself openly in Ross (1901), which in the work "Survey of the Foundations of Order", on the subject of social control, lays the foundations for a new conception of the social order, emphasizing the effect that the pressure from the group can have on the personality of the individual (Hertzner, 1951). Cooley (1902) stresses the need to study a person's life history in order to understand their behavior. In particular, his discussion of the "self-mirror" and the social origins of consciousness have served far more scholars to study the socialization process and the interactions between the individual and his group (Roucek, 1956). Sumner (1983), develops the concept of the importance of group customs, customs, institutions and value judgments as socio-cultural forms capable of organizing the behavior of individuals (Hertzner, 1951). In addition to giving substance to the rules of the group, these socio-cultural forms, without which it would not be possible to understand social behavior, are of primary importance in establishing the direction in which social control operates. The values and the social organization of the group largely determine the possible encouragement or inhibition, by the agents of social control, of some specific form of behavior (Roucek, 1956). Despite some interpretative differences, we are not dealing with mutually exclusive analyzes, but rather approaches capable of opening up a range of varied and diversified hypotheses. Indeed, there are those who, like Ross (1896), deal with the number and complexity of the means by which social control agents achieve processes of uniformity in behavior; those who, like Cooley (1902), use their energies to explain the effects of social control on personality development; and those who, like Sumner (1893), are interested in the roles and agencies that organize human behavior in certain models. Ross (1901), on the subject of "social control", identifies two dimensions: social and individual ancestry. In the preface to the 1901 book, in fact, the author states that the text refers to a small sector of sociology, called social psychology, which, in turn, has two branches (Bierstedt, 1981). The first of these, social ancestry, deals with the conditioning of society on the individual; while the second, the individual ancestry, takes into consideration the conditioning of the individual on society (Ross, 1918). Unlike Cooley, Ross appears to give a preliminary distinction to a clear distinction between individual and society, considering them as two separate entities (Bierstedt, 1981). For Cooley, on the other hand, the ego and society are born together: "We know immediately both of them, and the notion of a separate and independent ego is illusory" (Cooley, 1963). This does not mean only that the social conscience, "that is the awareness of society, is inseparable from self-awareness", but also that the personal aspect ("I") cannot be distinguished from the social one ("we").

As far as social ancestry is concerned, Ross (1896) argues that society possesses a sort of transformative power with which it

"shapes individual feelings and desires so as to adapt them to the needs of the group". This process, for its part, "is partly due to social influence and partly to social control" (Hertzner, 1951): these are the two components that give rise to the phenomenon of social ancestry (Ross, 1896). The social influence refers to the "conditioning exercised on the individual by the multitude of men from whom he is surrounded". Thus, it is "an accidental, random and devoid of a specific purpose" domain (Hertzner, 1951). By social control, on the other hand, "the conditioning on the aims and actions of the individual exercised on behalf of the group" is to be understood. It is not "a random or incidental power: it is intentional and has a conscious nature from its inception". It is "partly exercised by defined bodies, formally constituted and supported by the will of society, and partly by agencies of an informal and spontaneous nature which, knowingly or unknowingly, reproduce the interest and social function under constant supervision from above" (Ross, 1896). At the very moment when individuals acquire the idea of society, which appears as "something different from a simple cluster of people", social control is seen "as one of the ways in which living beings try to preserve themselves in the best of ways" (Hertzner, 1951). "The behavior that frowns are what in the long run hurts; the behavior that gives life smiles is what in the long run produces benefits" (Ross, 1918). For Ross, therefore, the consequence of social control consists in a state of order: "Clashes and chaos are avoided or completely regulated" (Hertzner, 1951). It is evident that we are facing one of the first, if not the first, that has been able to have identified the basis, nature and function of social control in the action of human society.

The need for a social order capable of channeling individual actions within socially accepted limits accompanies Ross's entire reflection, together with the conviction that this order "is a phenomenon that can only be explained by reference to society" (Bierstedt, 1981). This conviction emerges right from the start: "The personality that finds its manifestation in conditions of free communion can reach its own goodness, and the order is partly linked to this human nature, partly to the influence of the environment social. My task, therefore, consists first of all in separating the contribution of the individual to the social order compared to that of society, and secondly to bring to light all that is contained within this contribution" (Ross, 1918). If, in fact, the author maintains, a situation in which a group of pedestrians or vehicles are in constant collision with each other could suggest an absence of order, in the same way there is no order in a group of pedestrians or vehicles that they all go in the same direction in the same place (Bierstedt, 1981). In the second case, however, order is not necessary since there is no interference, collision, conflict. In other words, the order appears only within those situations that could be, so to speak, disordered in the absence of rules. According to Ross (1918), the reaction of individuals to order depends on their mental disposition: some are peaceful and respond promptly to it; others are aggressive and don't. Just as there are individual differences, in the same way there are racial differences: in a quiet race, once the order is established, the individual follows the prescriptions out of pure inertia. In an aggressive race, order is continually endangered by individual recklessness, and can only be maintained through the work of certain social forces (Ross, 1918). Beyond a racial disquisition, what is important to underline is that for Ross the social order is a

human product, and it is necessary to learn how violence was subjugated and confrontation controlled (Bierstedt, 1981). All this, in turn, does not find its origins in a simple hereditary genetic heritage. The animals refer to instinct, but the order of human societies does not coincide with that of the hive or herd. Park and Burgess (1924), outline the “social control” as “*a set of mechanisms that make possible the transformation of the community into a model society and that the mechanisms of social control are the product of a policy decision and an assimilation cultural*”. The two authors intend to eliminate any dissent and deviance by submitting and manipulating even popular religion, traditions and public opinion. The State should be idolized in the same way as a secular divinity that guarantees public peace at the price of depersonalizing the community, which should be denied any possibility of democratic protest. Therefore, there is no popular sovereignty, but rather an elite of technocrats who decide everything and command everything.

Ross, Park and Burgess have been hotly contested: Quiron (2001) and, before that, Cohen (1985) and Horwitz (1990) dispute the lack of “sense of measure in the matter of management of deviances”. An impeccable order is utopian. The “modest amount of crime” theorized by the Norwegian abolitionist Christie (2004) always remains in the concrete and everyday collective fabric. The company bears in itself a positive or, in any case, irrepressible conflict between lawful and unlawful. The protest and a moderate disorder are and will be physiological elements of the State and of Democracy. As noted by Quiron (2001), the natural lawyers and all those who speak of an alleged “original social pact” rely on an unsustainable and naive caricature, that of a normative consensus. Social control, conceived as a mechanism that makes relations between individuals possible, has been conceptualized within a “*bucolic vision of the social*”. In fact, during the early twentieth century, Ross, Park and Burgess were dramatically downsized. Ross justified the transformation of “social control” into a “class control” in which, in concrete reality, the “goddess”; reason, instead of serving the common good, manages the interests of a political group, which exploits power public to achieve personal profits, as in the paradigmatic cases of Nazi Germany and the Soviet Union. Similarly, Park and Burgess (1924) theorize the indisputable domination of a few over many in order to avoid violent collective conflicts, but even this “*ne cives ad arma veniant*” has no objective and realistic foundations. Park and Burgess (1924) focus social peace on the quadrinomial “competition, conflict, accommodation, assimilation”. In turn, competition would be part of an ecological order composed of struggles and impersonal interdependencies; every conflict is, or would be, a relationship of conscious and personalized force for the transformation or maintenance of the normal conditions of common moral and political life. Basically, according to Park and Burgess (1924), conflicts will still be reassembled within a social pact, which will be followed by a universally shared and, above all, indisputable nomogenesis. These theses have been considered not applicable due to the impossibility of postulating a collective bargaining agreement to which the community is subjected (Horkheimer&Adorno, 1944; Sellin, 1938). More realistically, Mead (1925) states that social control guarantees the security of institutions in change and, therefore, not in immobility and immutability, since “social control”, which is dominion, power and authority, is a symbolic whole and regulation whose content

depends on the social situations and the experience that people make over time. Social control creates a community, but this community depends on a particular situation. For Mead (1918), the social control of anti-normative deviations is constituted by a perennial dynamic meeting between I and You, of Freudian origin. Socialization occurs when the individual is confronted with the outside, denying, approving, criticizing and, in any case, living with others and with others, deciding, day after day, whether a conduct is or is not a tolerable deviance by the company. Thus, social control is the expression of myself when I meet others (Mead, 1918); therefore, social control depends on the degree of acceptance with which the person places himself towards the other members of a particular group in which social activities take place. (Mead, 1969). Living in society means communicating with others and sharing each other's experiences, in the knowledge that “others” can approve, but also disapprove of, the behavior of another partner. There have been many criticisms of Mead's theoretical framework, as there is still an immutable and undeniable moral foundation, as in the case of totally and totally unacceptable deviations. Serious meta-temporal and meta-geographical crimes demonstrate this, such as voluntary homicide, theft, incest, paraphilias, vandalism, euthanasia, false testimony and unjustified violence against the weakest members of the human consortium and family.

A further criminological attempt to counter the natural law theory was that of Mills (1963) which synthesizes every form of contrast to deviances in a series of psycho-linguistic or, in any case, communicative activities. According to Mills (1963), men have things that are mostly indirect. The quality of human life is determined by meanings received from others. The material existence determines the conscience and the men transmit values through the human language influencing in decisive way the consciences. Thus, in Mills' melancholy perspective, crime, deviance and law would be a linguistic or, at least, gestural product. Everything would be interpretable and interpreted. Indeed, social norms and values are produced with language, because behind each vocabulary there is a set of collective actions. Language organizes and determines behaviors. It is the omnipresent thread in structured human behavior (Mills, 1963). Unfortunately, as in the case of Mead, non-negotiable values remain and will remain. Some anti-normative deviations find their qualification in the ratio of some ontological prohibitions born with the human being itself: killing or torturing an elder for convenience or for fun is certainly not a linguistic fact, even where crime and ethical degradation abounds and familiar.

IV. THE RELATIONSHIP BETWEEN DEVIANT PHENOMENA AND THE LEGAL APPROACH. THE LAW AS A REPRESSIVE FORM OF DELINQUENT CONDUCT

It is too simplistic, according to many scholars, to simply postulate a social reaction in the face of any deviance, including those of a bagatellar caliber or simply borderline. The risk is to chase after the misleading idea of an impeccable legal order, in which the holders of state sovereignty are free to exercise the sanctioning liberticidal acts proper to a police state in which not even the slightest error is admitted. Robert (1984) provocatively asks himself: What does the great transformation brought about by the social reaction perspective try to solve? Certainly, there has

been a contribution that brings alive the fight against the ontogenesis of difference and that brings criminology from theory to practice. Basically, the risk is to practice “zero tolerance” without limiting “social control”, which must never turn into a subtle despotic instrument aimed at silencing dissidents and moderates (Black, 1984). Thinking and affirming that Criminal Law is an automatic reaction that immediately suffocates every deviation means wanting to take away the importance of criminological prevention. In this regard, Cohen (1985) recalls that “*the family, religion and neighborhood exercise important social control, well before having to be colonized by systems of control of deviance*”. Indeed, there are non-formal remedial instruments, which represent a valid alternative to the immediate and unquestionable imposition of the criminal law and penitentiary treatment. Robert (1984) points out that “it is enough to read a little sociology of deviance to find the practice of prevention. The perspective of social reaction today no longer conforms to the old stimulus-response scheme. Horwitz (1990) points out that social control is a mechanism that reverses the object of deviance, in the sense that not only is the binomial “*crime - penal sanction*”, but also the factors of prevention, the general preventive and the not simple construction of a climate of deterrence. Reacting and punishing is essential, but one must also socialize and self-control to reduce deviance even before it can manifest itself. Quirion (2001) argues that it is not the punishment that is central, but rather the regularization that is acting on a complex system, coordinating its actions and making it work correctly and regularly. Conversely, Parsons (1951) made a mistake in imagining a “static” rather than “dynamic” society. Still according to Parsons (1951) the crime is not at all preventable, indeed it is and will be unavoidable from the collective fabric. In contrast, Otero (2003) focuses on “social regulation”, that is to say preventive interventions, through the management of negative behaviors, coercion, mystification, manipulation, repression. Social control is also regulation, that is the ability of society to regulate itself according to the principles or values chosen. Similarly, Pratt (1997) prefers a state that regulates more than a state that controls. Also Spitzer (1983) rejects the idea of a “coercive regulation”, rather than (above all) “preventive”.

Unfortunately, the twentieth century, especially in the literature of the USA, is characterized by the habit of automatically associating the legal-penal sanction with any deviation. Scheerer&Hess (1997) believe that “*the concept of deviance must shift attention to alternative forms of control to law and criminal justice. Behavior control does not generally depend on legal institutions and formal interventions, but rather on how to form desires, models and dreams. Today out of habit we only think of police interrogations, rifles and correctional institutions*”. Societies are built on the basis of ideals, which, from the beginning, must be purified from any potential element of potential criminogenesis. The important thing is to build a solid moral foundation. Subsequent deviances are a consequence, not a cause. Reacting is automatic, but the essential is prevention by building well.

V. CONCLUSION AND DISCUSSION

In the 1980s there was an increase in criminal events and a crisis in the welfare state system. The common feeling is that delinquent is able to decide and does it consciously. Investments

shift from social rehabilitation treatment programs to those of deterrence and intimidation. We need to protect public order and the safety of citizens, this is the dominant leitmotiv. The objective is to achieve maximum safety with the minimum use of resources, inaugurating the economic cost-benefit policy by comparing financial investments with the levels of safety obtained. The non-monetary but repressive costs are also increased with the increase in prison sentences and, in some States where it was already provided for by the laws, a greater use of the death penalty, the absolute most “productive” condition. The purpose of these policies is the qualitative and quantitative reduction of behaviors that can compromise the safety of the community without questioning the causes that can generate illegal behavior. Social control escapes from prison and other total institutions to extend into the urban territory. Thus we come to think of the territory, understood as a physical and spatial environment, as a place of repression and prevention of street petty crime, also intervening on the modification of the pre-existing urban aspect.

We are witnessing the emergence of fortress neighborhoods with their own security agents, cameras and gates whose purpose is to combat criminalized subjects. The state agencies, the police, thus lose the monopoly of territorial control and security flanked by innumerable private agencies. In the new cartography of the territory the meeting places between groups and people change location. Agora - shopping center, leisure - shop, here are the new dichotomies: until the eighties the meetings took place in the public square, a typical product of the Italian urban culture, and the control was entrusted to police officers (police, carabinieri, city police, etc.); then the gathering places have moved into private environments, consumption and production centers (shopping centers, bars, discos) with control entrusted to private police (citizens of the order, etc.) whose task is to control and report to the authorities in charge of any irregularities. Private agents are armed and this leads to a possible increase in the level of confrontation. From a behavioral stimulus-response analysis it is possible to deduce that in the presence of armed agents there is a contrast to a delinquent intervention equipped with more powerful weapons. Public security is protected and the social order is preserved, considering the criminal phenomenon as normal, intervening in risk management through the logic of the economic market of supply and demand. The security business is constantly expanding and the Panopticon has outdone itself: with databases, data networks, cameras, control has really spread everywhere spreading itself throughout the day. Security policies create particular categories of subjects characterized by a high risk index: immigrants, toxic, destitute, radical political subjects, just to name a few. The deviant subject stands as the ideal typical case of a collective reality. The logic of the prevention of petty crime takes place, which is exercised through the control of the territory, driven in many cases and in numerous countries to the militarization and limitation of the citizens' space of action. Lianos and Douglas (2000) stated that “deviance is over”. The sociology of deviance is dead. In other words, when the percentage of a certain group of crimes falls, as in the case of crimes against the person, this does not mean that social control has improved, but that collective conduct has changed. Conversely, and specularly, if the incidence of an anti-normative and/or anti-social infringement increases, it is not said that the repressive practice has improved. US micro-crime is a clear confirmation of this. Said

otherwise, populist maximizing the typical or atypical sanctioning tools (night patrols, punitive beatings, private vendettas) does not affect the amount of crimes, especially in serious cases of robbery, private violence, voluntary homicide, extortion or rape. Paradoxically, the more the deviants are excluded, ghettoized and imprisoned, the more the incidence of anti-legal transgressions rises. Luhmann (2000) speaks of “epistemological problems” without a factual foundation. If a drug addict recently resides in a building, he will probably be blamed for thefts committed by third parties that will exploit the chronic use of drugs and the bad reputation of the new tenant. According to Carrier (2005) the Criminology of the 2000s, focuses on ethical constructivism, on selective constructivism, on discursive designation, on subjective victimization/oppression. In this regard, Luhmann (2000), censorship that “*ethical constructivism is false, since deviance is analyzed within two epistemological moments that are mutually contradictory: first a constructivist epistemology is used (social control contrasts deviance), then yes uses positivism (social control is limited to a normative reaction). Deviance and social control merge. The world is no longer what it is, but what is perceived*”.

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Effect of beeswax, gelatin and *Aloe vera* gel coatings on functional properties and visual sensory attributes of chicken eggs stored under room temperature

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Abstract- Surface coating is an inexpensive and effective method to preserve the internal quality and prolong the shelf life chicken eggs. Mineral oil is one of the commercial type coating materials with proven results. Therefore, this study was planned to determine the effect of beeswax, gelatin and *Aloe vera* gel coatings on functional properties of chicken eggs. Four hundred and fifty (450) brown shell eggs of 32 weeks old Lohmann classic brown layers were obtained and randomly divided into five groups as ninety (90) eggs per group. Four egg groups were randomly coated with one of the four coating materials: mineral oil, beeswax, *A. vera* gel and gelatin. Remaining group was uncoated and considered as the control group. Then, all eggs were stored for six weeks under room temperature (30°C) and relative humidity of 70 - 75 %. Beeswax and gelatin maintained the similar ($P > 0.05$) gelling strength to mineral oil coated eggs. There was no significant ($P > 0.05$) difference in foaming stability of uncoated and coated eggs. The present study demonstrated that beeswax and gelatin can be introduced as an alternative egg coating material to mineral oil due to their similar effect of preserving functional properties of eggs during storage under room temperature.

Index Terms- Beeswax, chicken eggs, coatings, functional properties, gelatin

I. INTRODUCTION

As an excellent source of protein, chicken eggs are among the most nutritious food consumed globally and their production has represented an important segment of the world food industry (Stadelman, 1995). However, shell eggs are highly susceptible to internal quality deterioration and bacterial growth during storage. As soon as eggs are laid, the aging process begins, altering their chemical, physical, microbial and function properties. Although the shell can be considered as natural barrier, shell eggs have short shelf life and are extremely fragile which can cause a serious economic loss to the poultry industry (Caner, 2005; Wong *et al.*, 1996).

Interior quality deterioration of fresh shell eggs can be delayed significantly by maintaining storage temperature near the freezing point (Zeidler, 2002). Numerous food grade coating materials have also proven to be efficient in reducing the mass transfer by sealing pores. Further, eggs coated with different protein-based

coatings have prolonged the internal quality due to the reduction of the breakage of eggshell and egg microbial contamination (Wong *et al.*, 1996). Edible coating maintains the functional properties of foods by decreasing moisture loss and gas transport (O_2 and CO_2) (Donhowe and Fennema, 1994). Considerable amount of research works has been done on coating shell eggs with edible coating materials and different results in terms of efficacy of prolonging the shelf-life and improving internal qualities of eggs were obtained depending on type of the coating material (Ikame and Enelamah, 1985).

Our previous study compared the potential of beeswax, *Aloe vera* gel and gelatin as an egg coating materials to preserve the physical quality and enhance the shelf life of chicken eggs (Mudannayaka *et al.*, 2016). Beeswax is a product of honey bees with natural antimicrobial substances (Zanoschi *et al.*, 1991). Due to these antimicrobial and barrier properties against moisture and gases, beeswax has been utilized in food processing as packaging and coating material. *A. vera* is a tropical and sub-tropical plant, which contains colorless and odorless gel in leaves. This gel can act as a protective layer against oxygen and moisture. Therefore, it has been used as surface coating of fruits to preserve quality during storage (Supapvanich *et al.*, 2016). Gelatin is obtained by controlled hydrolysis of fibrous insoluble protein collagen, which is widely found as major component of the skin, bone and the connective tissues of animals. It is used to encapsulate the moisture or oil phase in food ingredients and pharmaceuticals. Due to its barrier properties, there is an increasing interest to use gelatin as a surface coating material (Gennadios *et al.*, 1994). We compared the effect of above three coatings with mineral oil which is currently used to preserve the internal quality of eggs (Waimaleongora-Ek *et al.*, 2009; Jirangrat *et al.*, 2010) and found that beeswax and gelatin can be successfully used to preserve the internal quality of chicken eggs (Mudannayaka *et al.*, 2016). Therefore, this study was carried out to further evaluate the effect of beeswax, gelatin and *A. vera* gel coatings on functional properties of chicken eggs.

II. MATERIALS AND METHODS

A. Selection of Eggs

Four hundred and fifty (450) brown shell eggs were obtained from 32 weeks old Lohmann classic brown layers at local producer

(NEL Farm, Mangalaeliya, Sri Lanka). All the Layers in the farm had been vaccinated for salmonella at chick stage so eggs were free of vertically transmitted *Salmonella* spp. The eggs were obtained from battery cages therefore had lesser dirt and egg were furthermore cleaned by wiping with piece of steel wool to clean any possible dirt on shell. All the eggs were selected less than 6 hours after laying and were in the range of 49 g - 64 g. In addition, eggs were unfertile and free of cracks and defects. Eggs were placed in clean egg crates in room temperature after been brought to laboratory and all the eggs were randomly divided in to five treatment groups as ninety (90) eggs per treatment.

B. Preparation and application of Coating Materials

During the preparation of coating solutions and application, sterile latex gloves were worn to avoid any possible contaminations. Mineral oil (viscosity 26.35 mPa s at 20°C, weight per ml at 25°C = 0.828gm, light absorption at 240-280 nm = 0.031, transparent, colorless, odorless, food grade) was obtained from Glorchem Enterprise (No 141, Bankshall Street, Colombo 11, Sri Lanka). Eggs were immersed individually in mineral oil solution for 1 minute (Mudannayaka *et al.*, 2016) for the coating. Crude beeswax is commonly available in local shops in Sri Lanka. Beeswax was cut into small pieces and put into a clean 500ml beaker. The content was heated in a water bath at 40°C until it became a liquid and cooled until the wax become semi solid state and coated on eggs by rubbing wax on egg surface by hand (Mudannayaka *et al.*, 2016). Fresh *A. vera* leaves were taken from the *A. vera* plants grown in Wayamba University, Makandura premises, Sri Lanka. Then, outer cover of the *A. vera* leaves was scraped by clean knife and thin layer of gel was directly applied on eggs manually (Mudannayaka *et al.*, 2016). 10% Gelatin solution was prepared by mixing commercial gelatin powder with distilled water while heating in a water bath (80°C) for 10 minutes. After the solution becomes cool eggs were immersed individually by hand in the gelatin solution for 1 minute (Mudannayaka *et al.*, 2016).

C. Storage of coated eggs

After coating, all the coated eggs were dried at room temperature for 24 hours. Uncoated eggs served as control and mineral oil coated eggs served as positive control. Then all the eggs (90 eggs per treatment) were placed in small end down position in labeled open molded plastic eggs trays and stored in room temperature (30° C) and relative humidity of 70 % - 75 % for six weeks. Using three replicates per treatment albumin pH, gelling strength, foaming capacity and foaming stability were measured after 24 h from coating (0 week) and by weekly intervals for 6 weeks of storage period.

D. Determination of Albumin pH

Albumen and yolk were separated into 50 ml beakers and thin and thick albumen were mixed thoroughly. Then albumen pH was measured with pre calibrated digital pH meter (Starter 3000, OHAUS, USA) at 25°C. Three replicates per treatment were taken at each week.

E. Determination of gelling strength

Whole eggs were broken into 50ml plastic containers and homogenized at 12,000 rpm for one minute with homogenizer. Then homogenized eggs were kept in a preheated water bath at

85°C for 30 min with continuous stirring. After gel had been formed samples were removed from the water bath and cooled to room temperature. Then gels were removed from the containers and cut into equal size gel cubes. Subsequently gelling strength was measured by penetrometer (FT 011, David Bishop Instruments, London).

F. Measurement of foaming properties

Foaming capacity (%) and foaming stability (%) were measured to evaluate forming properties. 15 ml of well mixed whole eggs were put into 50 ml beakers and whipped for 1 min with homogenizer at 12000 rpm to make foam. After 30 seconds of foam formation, initial volume of foam and the liquid phase were measured. Then volume of the liquid phase was measured in 5 min intervals for 1 h. Foaming capacity (%) was calculated as, (volume of foam / volume of the initial liquid phase) ×100%. Foaming stability (%) was calculated as, [(volume of the initial liquid phase – volume of drainage) / volume of initial liquid phase] ×100% (Ferreira *et al.*, 1995).

G. Visual sensory evaluation

After 6 weeks of storage period visual sensory evaluation was done with 30 untrained panelists to evaluate consumer preference for coated eggs with different coating materials. Preference for surface color, surface odor, surface glossiness, surface smoothness and overall acceptability of uncoated and coated eggs were evaluated using a scoring system as: 5 = like very much, 4 = like slightly, 4 = neither like nor dislike 2 = dislike slightly and 1 = dislike very much.

H. Statistical analysis

Data were analyzed using general linear model procedure considering the main effects of coating, storage time at 95% confidence level. When main effect was significant, the Tukey's comparison test was performed to identify significant differences within treatments in a particular week and differences within storage period in a particular treatment. Minitab statistical software (version 15.1.1, USA) was used for analysis. Mean values of scores given by 30 panelists for each visual sensory attribute in each treatment were calculated and analyze using hedonic scale of Microsoft excel, 2007.

III. RESULTS AND DISCUSSION

A. Effect of beeswax, *A. vera* gel and gelatin coatings on gelling strength

Gelling strength tests the heat stable gelling properties of egg albumen. During the first 3 weeks, no significant differences ($P > 0.05$) of gelling strength among treatment groups were observed (Figure 1). After 4th week significant differences between treatments were observed up to 6th week of storage period. Uncoated and *A. vera* gel coated eggs obtained significantly higher ($P < 0.05$) gelling strength than other treatments (Figure 1). Gelling strength of beeswax and gelatin coated eggs was similar ($P > 0.05$) to mineral oil coated eggs throughout the storage period of eggs. According to Donovan and Mapes (1976), during storage, ovalbumin in egg white is converted to s-ovalbumin which is an extra heat stable form (denaturation at 92.5°C) in comparison to

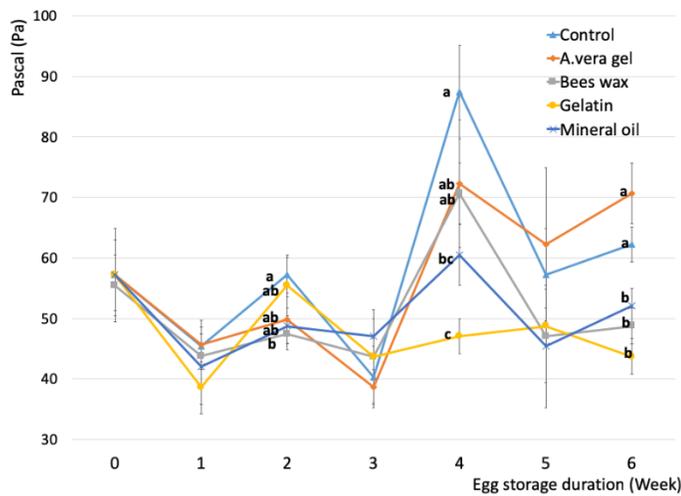


Figure 1. Change of gelling strength of control and coated eggs during 6 weeks of storage at 30°C. Different letters (a to c) with in a particular week are significantly different at $P < 0.05$.

to ovalbumin (denaturation at 84.0°C). According to Donovan and Mapes (1976), during storage, ovalbumin in egg white is converted to s-ovalbumin which is an extra heat stable form (denaturation at 92.5°C) in comparison to ovalbumin (denaturation at 84.0°C). S-ovalbumin has slightly lighter molecular weight than ovalbumin and its relative quantity in the egg weight can increase during storage period. Both pH and temperature also affect the s-ovalbumin formation, in a way that formation of s-ovalbumin increases with increasing pH of albumen (Smith and Back, 1962). During the storage dissolved CO₂ in egg albumen migrates through the shell to the environment and leads to increase of egg white pH (Health, 1977; Smith 1931). When eggs are coated with oil, they concentrate protein or stored under refrigeration, this conversion is delayed as a result of lower CO₂ loss via egg shell pores (Alleoni and Antunes, 2004). Results in present study agree with these observations. As mentioned above higher gelling strengths were observed in uncoated and *A. vera* gel coated eggs at 6 week of storage. As shown in the figure 2 we observed the pH of control and *A. vera* gel coated eggs was significantly ($p < 0.05$) higher than other eggs at week 6. This may be due to higher CO₂ loss of control and *A. vera* gel coated eggs. At the same time lower gelling strength was observed in beeswax, gelatin and mineral oil coated eggs. Observation of lower pH rise of beeswax, gelatin and mineral oil coated eggs describes that these coatings can block the CO₂ migration from egg white to environment. As reported previously although beeswax and mineral oil improved the physical properties of eggs during storage (Mudannayaka *et al.*, 2016) their effectiveness to maintain the gelling strength lasted only for 5 weeks.

B. Effect of beeswax, *A. vera* gel and gelatin coatings on foaming properties

Egg albumen has excellent foaming properties, which can affect by protein interactions with ovomucin, lysozyme and to a lesser extent ovomucoid, ovotransferrin and ovoalbumin. Foaming

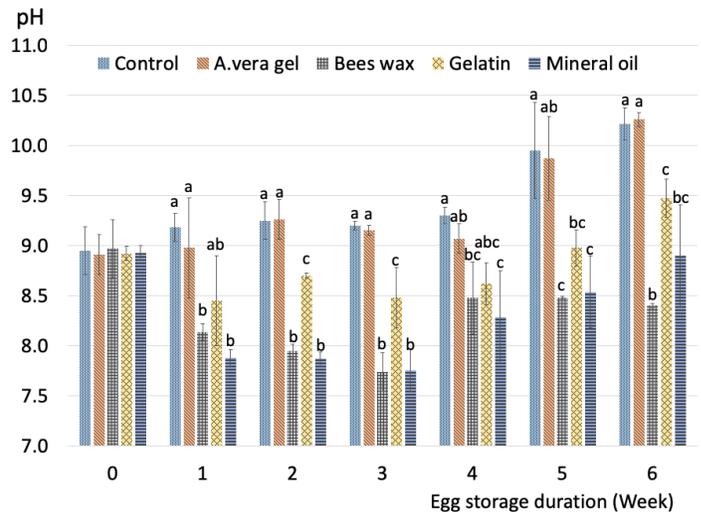


Figure 2. Albumen pH of control and coated eggs during 6 weeks of storage at 30°C. Bars represent mean \pm SD; means with different letters (a to c) with in a particular week are significantly different at $P < 0.05$.

properties can be evaluated by foaming capacity (FC) and foam stability (FS) (Ferreira *et al.*, 1995). At the beginning of the study all uncoated and coated eggs had same foaming capacity (FC) and FC of coated eggs gradually increased with storage period (Table 1). After 4 weeks of storage period uncoated eggs had significantly lower ($P < 0.05$) FC, whereas, beeswax and gelatin coated eggs achieved significantly higher ($P < 0.05$) FC than other coated eggs. But after 6 weeks of storage period at 30°C, there was no significant difference ($P > 0.05$) in FC between all egg groups. As shown in Table 2, although the foaming stability (FS) of all the treatment groups varied with storage period, no significant difference ($P > 0.05$) was observed between uncoated and coated eggs when compared at each week. These results suggests that beeswax and gelatin coatings can improve the forming properties of chicken eggs up to 4 weeks of storage at room temperature. It should note that the functional properties of eggs are highly influenced by several factors such as hen's age, storage time, beating time, homogenization, temperature and pH (Lomakina and Mikova, 2006). Since we maintained similar conditions for all the treatments, influence of those factors on the results is negligible.

Table 1. Foaming capacity of uncoated and coated eggs during 6 weeks of storage at 30°C

Coating	0 wk	1 wk	2 wk	3 wk	4 wk	5 wk	6 wk
Control	22.44 \pm 2.14 ^{A,a}	18.89 \pm 1.93 ^{B,a}	13.33 \pm 3.33 ^{B,a}	36.66 \pm 3.34 ^{C,a}	27.77 \pm 1.93 ^{A,a}	45.55 \pm 1.92 ^{D,a}	53.33 \pm 3.33 ^{D,a}
<i>A. vera</i> gel	23.11 \pm 3.01 ^{A,a}	22.22 \pm 3.85 ^{A,a}	30.00 \pm 3.06 ^{AB,b}	34.66 \pm 3.46 ^{B,a}	32.22 \pm 3.85 ^{B,a}	45.55 \pm 1.92 ^{D,a}	51.11 \pm 1.92 ^{D,a}
Bees wax	22.22 \pm 1.92 ^{A,a}	24.43 \pm 1.93 ^{A,a}	14.66 \pm 1.76 ^{B,a}	35.33 \pm 4.06 ^{C,a}	42.22 \pm 1.92 ^{D,c}	43.33 \pm 0.00 ^{D,a}	54.00 \pm 2.40 ^{E,a}
Gelatin	23.11 \pm 3.01 ^{A,a}	26.66 \pm 3.34 ^{A,b}	23.33 \pm 3.33 ^{A,b}	41.55 \pm 3.08 ^{C,a}	36.67 \pm 2.31 ^{C,b}	41.11 \pm 1.92 ^{C,a}	53.00 \pm 1.00 ^{D,a}
Mineral oil	22.22 \pm 1.92 ^{A,a}	21.11 \pm 0.10 ^{A,a}	32.22 \pm 1.92 ^{B,b}	36.33 \pm 3.51 ^{BC,c}	32.22 \pm 3.85 ^{BC,ab}	41.11 \pm 1.92 ^{C,a}	52.00 \pm 1.75 ^{D,a}

Different superscripts of means \pm SD within a row (A to D) and column (a to c) are significantly different at $p < 0.05$.

Table 2. Foaming stability of uncoated and coated eggs during 6 weeks of storage at 30° C

Coating	0 wk	1 wk	2 wk	3 wk	4 wk	5 wk	6 wk
Control	93.44± 1.50 ^A	98.00± 0.00 ^B	95.99± 1.15 ^{CD}	91.77± 1.39 ^A	97.11± 1.02 ^{BC}	92.00± 2.91 ^{AD}	93.33± 0.00 ^A
<i>A. vera</i> gel	94.44± 3.85 ^{AB} C	94.66± 4.05 ^{AB} C	96.44± 1.02 ^A	93.33± 2.90 ^{AB}	94.88± 1.68 ^{AB}	88.67± 2.31 ^C	92.66± 2.40 ^B
Bees wax	94.00± 3.52 ^{AB} CD	94.00± 0.00 ^A	98.00± 0.67 ^B	92.89± 1.39 ^{CA}	93.78± 2.04 ^{CA}	88.66± 2.40 ^D	92.33± 0.00 ^C
Gelatin	94.44± 0.38 ^A	96.89± 1.02 ^B	97.11± 0.77 ^B	91.78± 3.08 ^A	96.88± 0.39 ^B	90.66± 3.71 ^A	92.66± 3.52 ^A
Mineral oil	94.44± 1.92 ^A	96.00± 2.40 ^{AB}	94.44± 3.85 ^{AB} C	93.33± 3.33 ^{AB} C	96.66± 0.00 ^B	89.11± 1.92 ^C	94.44± 2.77 ^B

Means ± standard deviations of 3 measurements. Different superscripts (A to F) of means ± SD within a row are significantly different at p<0.05. All the means ± SD with in a column (particular week) are not significantly different at p>0.05.

C. Visual sensory evaluation

Visual appraisal is the first sense that consumers use in making a decision to purchase products (Caner and Cansiz, 2007). Figure 3 shows the differences in consumer preference for visual sensory attributes of uncoated and coated eggs. Gelatin coated eggs were highly preferred for odor, surface glossiness, surface smoothness and overall acceptability except surface color. But, *A. vera* gel and beeswax coated eggs were less accepted in all the evaluated attributes compared to uncoated and other coated eggs. This explained that gelatin could improve the visual and sensory attributes of coated eggs than uncoated and mineral oil coated eggs. Because of beeswax coated eggs were less accepted in visual sensory attributes better application methods could be developed to improve the appearance and surface characteristics.

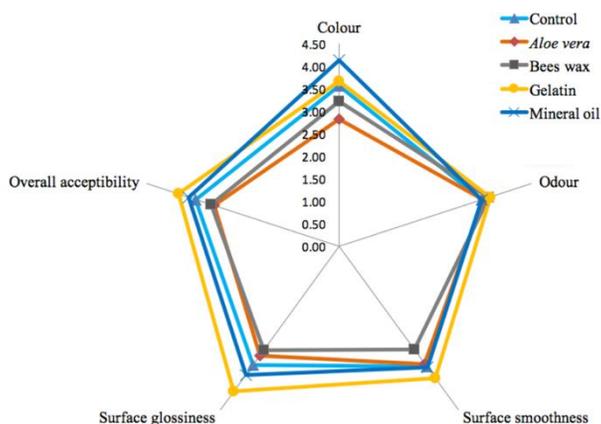


Figure 3. Differences in visual sensory attributes of control and coated eggs after 6 weeks of storage.

IV. CONCLUSION

Coating eggs with Beeswax, gelatin and *A. vera* gel show similar gelling strength and forming stability compared with mineral oil coated eggs. Further the effect of beeswax and gelatin on forming capacity was higher than the mineral oil coated eggs and uncoated eggs after one month of storage. Ability of these two coating materials to save the physical properties during storage of eggs was previously reported. Therefore, beeswax and gelatin can be introduced as alternative egg coating materials for mineral oil which has ability to keep overall quality of chicken eggs during storage.

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Implementation Of Community-Based Tourism In Relation To Women's Entrepreneurship Spirit In The Tourist Area Of Kenjeran Beach Surabaya

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Abstract: Community-based tourism development is closely related to community empowerment and gender mainstreaming. The existence of the Kenjeran Beach Amusement Park managed by the Surabaya City Government provides ample opportunities for local residents to trade around tourist attractions. The obstacle to developing community-based tourism lies in the low ability of human resources in the field of entrepreneurship to increase business scale, innovate and improve according to the demands and standards of tourists. The Kenjeran Beach Amusement Park merchant community has a role as an arm of the government to manage and develop community-based tourism in the Kenjeran Beach Amusement Park.

Key words: *Entrepreneurship spirit, community-based tourism, women's entrepreneurship*

BACKGROUND

Article 2 of Law No. 10 of 2009 on Tourism stipulates that tourism shall be organized based on the benefit, family, fair and equitable, balance, independence, preservation, participatory, sustainable, democratic, equality and unity principles. Meanwhile, Article 3 stipulates that tourism serves to meet the physical, spiritual and intellectual needs of every tourist by recreation and travel as well as increasing the State's income. Article 4 stipulates that tourism aims to: 1) increase economic growth; 2) improve people's welfare; 3) eradicate poverty; 4) overcome unemployment; 5) conserve nature, environment and resources; 6) advance culture; 7) improve the image of the nation; 8) cultivate the love for the country; 9) strengthen national identity and unity; and 10) strengthen friendship among nations.

Therefore, Surabaya tourism with all of its dynamics cannot be separated from the principles, functions and objectives of tourism as mandated in the legislation above. The present study put an important emphasis on the participatory and equality principles, where community-based tourism (CBT) is a practice and representation of the participatory principle and the study subjects, women craftsmen of processed marine products, were closely related to the equality principle. The increasingly advanced tourism, on the one hand, should be positively correlated to the increasing number of people actively involved in tourism development, at least around the tourist areas, and provide wider opportunities for women to obtain decent jobs and be self-employed in the tourism sector on the other.

The importance of the present study was its main subject of study, which was a group of female crafters of processed seafood products in the tourist area of Kenjeran Beach Surabaya. They drive and embody CBT amidst the dynamics of Surabaya's tourism development in general. On the other hand, the perceived gender discrimination is quite strong to attach women as a subordinated party to men, both in the private and public sphere – in this case, jobs and entrepreneurship in the tourism sector. Processed seafood products consist of crackers, snacks, salted fish, shrimp paste and shrimp sauce (*Kompas, Edisi Jawa Timur*, 1/4/09, p. K).

The present study was a descriptive study to identify the following: first, what is the pattern of the application of community-based tourism in the tourist area of Kenjeran Beach Surabaya? Second, what is the role of female crafters of processed seafood products in driving community-based tourism in the tourist area of Kenjeran Beach Surabaya? Third, how does women's entrepreneurial spirit influences the implementation of community-based tourism? Fourth, how does women's entrepreneurship spirit develop community-based tourism in the tourist area of Kenjeran Beach Surabaya?

LITERATURE REVIEW

The references supporting the present study were broadly divided into: first, community-based tourism, which also relates to the theory of local community participation around tourist attractions; second, entrepreneurship spirit, especially business management and development in the tourism sector; third, community empowerment and women empowerment in particular. References were taken from journals on related topics, books, regulations and program documents as well as relevant government agency policies.

Community-Based Tourism

The world tourism paradigm of the 21st century which is a reflection of the political climate of the international tourism community puts more emphasis and leads future tourism to the following conditions: back to nature and basic culture, community-based tourism development, consumer protection. The UN-World Tourism Organization releases the theme of international tourism development which emphasizes 3 important issues: poverty alleviation, job creation and social harmony.

Community-based tourism (CBT) is tourism in which local residents (often rural, poor and economically marginalized) invite tourists to visit their communities with the provision of overnight accommodation. The residents earn income as land managers, entrepreneurs, service and produce providers, and employees. At least the part of the tourist income is set aside for projects which provide benefits to the community as a whole. Community based tourism enables the tourist to discover local habits and wildlife, and celebrates and respects traditional cultures, rituals and wisdom. The community will be aware of the commercial and social value placed on their natural and cultural heritage through tourism, and this will foster community based conservation of these resources (responsibletravel.com).

Nurhidayati (2008) defines CBT as: 1) a form of tourism that provide opportunities for local people to control and be involved in tourism management and development; 2) people not directly involved in tourism businesses also benefit; 3) demand political empowerment and democratization and distribution of profits to disadvantaged communities in rural areas.

Thus, in essence, CBT is an embodiment of the expansion of the impact of the tourism sector on local economic development of communities around the tourist area. Efforts are taken through opportunities given to the community to get jobs and entrepreneurship opportunities in the tourism sector more broadly. The present study specifically focused on the role and involvement of women with their spirit, mentality and typical entrepreneurship instinct with the specification of processed seafood products.

Community-based tourism development can also be defined as an activity of local communities to promote various values and create a community filled with energy by utilizing nature, culture, history, industry, talented people, and other resources in full. Community-based tourism development aspires all components of the community to think, discuss, and take concrete actions (Natori, 2001 (in Madiun, 2010)).

Community-based tourism development in various fields requires absolute conditions, that is, the community as an agent of development should master the substance of the development to be undertaken. Understanding the concept of tourism development is critical for the community who will undertake the development, in preparation for the development.

Theory of Participation

Tourism planning should be directed to a pattern of sustainable tourism development by actively involving stakeholders, especially the local community, starting from the planning, voluntary action, and maintenance of tourist attractions; thus, tourism development needs to be more "bottom-up" since the community itself who will shape the area constitutes the major actor of tourism and reaps the direct impacts (Soedibyo & Habibie, 2005).

In the context of tourism development, participation is achieved by means of, first, managing the surrounding of one's own home and each area by maintaining order, giving greater attention to efforts of greening and preservation of the environment by participating in reforestation movement; second, being friendly to someone or tourists as a reflection of a good attitude in relationships; third, providing clean and safe tourist facilities, such as hotels and transportation; fourth, complying with the rules; fifth, preserving rural art; sixth, playing an active role in implementing preventive measures against crime and other actions that harm tourism. Factors affecting community participation in tourism development programs are: first, the willingness to improve their standard of living; second, the desire to preserve the surrounding natural wealth; third, the desire to maintain the security of their area from negative influences; and, fourth, the desire to maintain and introduce the local culture (ibid).

Entrepreneurship Spirit

In 2006, Copernicus Marketing Consulting & Research conducted a research on the success of women in marketing. The findings showed that 81% of them wanted to become Chief Marketing Officer (CMO) in the future relative to men with only 68%. Women succeed in marketing since they listen to consumers better. A total of 45% of respondents said that women understand the importance of "emotional connection with the brand". In addition, women are fond of collaboration and have a desire to influence and not to command their colleagues (*Majalah Mix*, March 2009, p. 31).

The object of the preset study was the merchants in Kenjeran Beach Amusement Park, who were entirely women and could be categorized as SMEs. According to Hafsah (2000: 150), SEs and SMEs in Indonesia experienced internal problems, including: 1) low professionalism of small business management personnel in terms of entrepreneurship, management, production techniques, product development, quality control, due to the entrepreneur's low level of education; 2) limited capital and lack of access to banks and markets, resulting in weak capital structure; 3) inadequate technological mastery.

Hall Hill (*Asian Survey*, 2001) said that SMEs constituted the important subject of studies and policies in Indonesia today. The reasons included: first, SMEs in each country provide a vital role for economic development by the wider community since it employs more than 60 percent of the workforce. Second, it is clearly and consistently a priority of the Indonesian government currently. Third, it has a special meaning when it is related to the issue of equity.

Law No. 9 of 1995 concerning Small Businesses stipulates that small and medium business sector are those that have a net worth of a maximum of IDR 200 million, excluding land and buildings where the business is located or, have a maximum annual sales of IDR 1 billion.

Some business opportunities that communities can develop in the tourism sector are as follows: first, provision of tourists' amenities, comprising of:

- Accommodation, where the community can provide part of their homes for tourists (home stays) and be the host, or provide small-scale commercial accommodation (lodges), which do not need to be luxurious but meet the cleanliness and safety standards. This preparation is another alternative to more classy hotels.
- Food Service, where the community can provide food and drink services. Studies on domestic tourist behavior demonstrated that their need for this service was quite high. It is possible to serve foreign tourists, provided that the basic conditions of hygiene can be met. The problem lies in 'cleanliness' and 'serving methods', in which the community in general is not yet aware of what should not be done since it is still acceptable in their own point of view; for example, handling food with bare hands. This food service can or should display Indonesian food and beverages or, especially, regional food and beverages.
- Tour guides, local people as those who know the ins and outs of their area are the best choice for guides, for example, guides for entering forested tourist areas, trekking, diving and so on.

The second is the provision of transportation services (accessibilities), locally or regionally, consisting of :

- Traditional *andong* (carriage) transport, as transportation and attraction, and other public transportation, such as taxibike, traditional boat, can all be done by the community.
- Inter-city and inter-island transportation using mini buses, private vehicles concurrently serving as rent cars, motorboats or traditional boats. Utilization of people's vehicles is even an important part in the series of tourist experiences.

The third is other services such as photographers at tourist sites, salons and massages, such as those found in Kuta, photo studios for local clothes, self-painting, telephone booths, and others. The fourth is souvenirs which are favored by tourists and made by people with inherited skills and creativity. These souvenirs can be:

- Traditional hand crafts: weavings, *songket*, carvings and so on.
- Contemporary crafts: recycled paper, glass painting, dried flowers.
- Food products: crackers, sweets, special cakes and so on.
- Agricultural products: ornamental plants, cut flowers, vegetables, packaged fruit for souvenirs, and others.

In addition to services directly delivered to domestic and foreign tourists, the most important part is community participation or community economic development that does not directly serve tourists, but meet the demands of other tourism industries (meeting the needs of the second stage), namely being suppliers of hotel needs for:

- Agricultural products for consumption; rice, vegetables, fruits, eggs, milk, etc.
- Functional items and accessories; waste baskets, tissue paper containers, recycled art paper, candles and so on.
- Special services, such as landscaping, including nurseries, maintenance or cut flower businesses.
- Souvenirs for promotion: ballpoints with puppet stems, sandalwood or simply wood with artistic touches, ceramic ashtrays and various other items.
- Special furniture, such as chairs, sofas, tables that can be used by the tourism industry.
- Etc.

Community Empowerment

The populist economy can simply be defined as an economy that rests on and sides with the people or the wider public. In order to strengthen the position and role of the people's economy in the national economy, efforts will be made to accelerate structural changes, which require fundamental steps which include allocating resources, strengthening institutions, and empowering human resources or empowering communities.

Community empowerment in this case includes two conceptions: the concept of community development and the concept of community-based development. The concept of community development comprises ideas of increasing community empowerment through improving the individuals belonging to the community. This empowerment improvement is pursued through efforts to improve health and education, assuming that a physically and mentally healthy and educated community is expected to be more creative and innovative to form a community with a high level of empowerment.

Thus, community empowerment can be defined as: first, efforts to improve the ability and independence. Community empowerment is not merely an effort to increase income, but it has a deeper meaning, including the enforcement of democratic economy and people's economic sovereignty. Economic activities take place from the people, by the people, and for the people; and this is what is referred to as the people's economy. The people's economy can be established depending on the mastery of technology, ownership of capital, access to markets, and information and management skills, in addition to the supportive political environment.

The two conceptions are a unity in the sense that each is closely related; the empowered people should also be given the opportunity to participate in development in accordance with their capacities and desires. With regard to enhancing empowerment, the empowerment concept includes 2 (two) aspects: first, *enabling*, which is to create an environment and atmosphere that allows people to develop; second, *empowering*, which is to strengthen the potential of the community and establish individual characters to be more capable and self-reliant in the face of challenges and problems of life in the development. Included in this concept of empowerment is protection against unequal forces.

Women Empowerment

The obstacle encountered is that there are many women with low education, lacking skills for certain matters, especially the latest technology. Women's low quality of life is caused by the limited participation, opportunities, and access and control to participate in various fields of development, both as agents of change and as beneficiaries of development. Other factors that cause women's low quality of life include the socio-cultural climate or environment not yet conducive to women's progress. One of the results of the Johannesburg Declaration (2002) was to provide opportunities for women to improve their quality of life (Irwan, 2009).

The Government of Indonesia has formulated a vision of women's empowerment: "Justice and Gender Equality, Child Welfare and Protection in Family, Community, National and State Life." In order to realize the vision, there are several missions that need to be achieved:

1. Improvement of women's quality of life in the areas of:
 - a. Integrated education and training consisting of spiritual, intellectual and practical education;
 - b. Health and family planning;
 - c. Economy and employment;
 - d. Politics and law;
 - e. Development and information resources;
 - f. Social and state welfare.
2. Promotion of gender equality and justice:
3. Elimination of all forms of violence against women based on the "zero tolerance policy", one that cannot tolerate the slightest act of violence against women.
4. Respect for the dignity and human rights of women as well as respect for and protection of women's reproductive functions.
5. Child welfare and protection.

In order to successfully achieve the missions of women's empowerment, there are several policies for the development of women's empowerment:

1. One-stop policy and gender mainstreaming in enhancing women's position and role.
2. Improvement of the quality of women's human resources in order to achieve women's improved position and role.
3. Legal and regulatory reforms.
4. "Zero-tolerance policy" in the elimination of violence against women.
5. Improvement of women's dignity and human rights.
6. Empowerment of government institutions in empowering women.
7. Improvement of the quality of women's roles and independence and organizations.
8. Increased community participation.
9. Expansion of the reach of women's empowerment.
10. Increased implementation of international commitments (*ibid*).

METHODS

The methods of the present study included observation, interview and questionnaire. The present study used primary and secondary data. Primary data were obtained through interviews, questionnaires and field observations. Samples of the visitors of Kenjeran Beach were taken by the accidental sampling method (Kusmayadi, 2004). Secondary data were obtained by means of the policy desk review of the Surabaya Culture and Tourism Office, the Women's Empowerment and Family Planning Agency of the East Java Provincial Government, the Community Empowerment and Family Planning Agency of Surabaya City Government, the management of Kenjeran Beach, and information, news and discourses from the mass media related to the research topic.

Interviews were made by gathering information in structured questions asked to the merchant association of Kenjeran Beach Amusement Park, most of which being women of processed seafood products, the management of the Kenjeran Beach tourist area, and Surabaya tourism stakeholders consisting of the Surabaya Culture and Tourism Office and the Surabaya Tourism Association Promotion Board.

ANALYSIS AND DISCUSSION

Overview of the Research Location

The Kenjeran Beach Amusement Park is a natural beach tourist attraction covering an area of ± 2.3 hectares managed by the Surabaya City Government. It is located in the eastern part of the city of Surabaya, precisely in Kelurahan Kenjeran. This tourist attraction is open every day, from 7:00 to 18:00 with an entrance ticket of IDR 10,000 for children and IDR 15,000 for adults.

Tourist attractions available in the Kenjeran Beach Amusement Park include children's playground, windsurfing, sea cruises and tourist events. Meanwhile, the facilities available include toilets, souvenir shops, prayer rooms, and traditional markets.

The merchant booths the area of the Kenjeran Beach Amusement Park are levy-charged (based on Regulation of Surabaya City Number 9 of 2007 regarding Levies on Recreation and Sport Points) at varied rates per meter square for food stalls, souvenir markets and fish markets and paid monthly.

According to the Chairman of the Community Resilience Institute (LKMK) of Kelurahan Kenjeran and the Coordinator of the Community Self-Reliance Institute (BKM) of Kenjeran Kelurahan, in 2009 Kenjeran Kelurahan received PNPM funds of IDR 200 million allocated for three areas of activity. First, the environmental activities included the construction of two toilets sized 3x4 meters and road paving of 50m². Second, the economic areas included savings and loan funds worth IDR 115 million used by 24 people (craftsmen and merchants around Kenjeran) where each individual got a loan of IDR 500,000. Third, the social areas included equipment (television and mother's uniform) assistance for early childhood education (PAUD).

Based on field observations and interviews with one member of the LKMK, some of the obstacles and weaknesses experienced by female merchants in the Kenjeran Beach Amusement Park were as follows. First, there was a low quality of human resources. Second, the business management was run 'in shambles'. That is, business management was not based on appropriate management principles where business turnover and profits were managed in such a way as to sustain business in the

future. Third, there was reluctance of merchants to accept positive, useful and important inputs for the progress and future of their businesses. They were not open to new ideas and matters related to business management, especially stimuli to innovate and create unique products.

The merchants of shellfish crafts in the Kenjeran Beach Amusement Park had an average turnover of IDR 200,000 to IDR 300,000 per day. In total, the number of shellfish craft merchants in Kenjeran Beach Amusement Park was 38 people, smoked fish merchants 26 people, and processed seafood product (crackers, *lorjuk*, salted fish, etc.) merchants 40 people. The management of the Kenjeran Beach Amusement Park also provided convenience and facilitation to local residents to sell around the tourist area. Likewise, the local residents were free to enter the tourist area. The Kenjeran Beach Amusement Park is located in Kelurahan Kenjeran of Kecamatan Bulak, also adjacent to Kelurahan Sukolilo of Kecamatan Bulak.

Data showed that the percentage of businesses engaged in fisheries was higher than that of supermarket/convenience store businesses. These data convincingly demonstrated that the people around the Kenjeran Beach Amusement Park were indeed more interested in the fishery businesses. This was also supported by their sea surroundings.

Table 1
 Number of Trading Businesses

DESCRIPTION	NUMBER
Convenience store	23 business units
Fishery	30 business units
Total	53 business units

Source: Report of Profile Data Compilation of Kelurahan Sukolilo Village, Kecamatan Bulak 2017

The Kenjeran Beach Amusement Park

In this section we will show how many visitors kenjeran beach amusement park for 4 years.

Table 2
 Visitors to the Kenjeran Beach Amusement Park, 2014–2017

Years			
2014	2015	2016	May 2017
248,876	269,547	326,683	131,478

Source: Regional Technical Implementation Unit (UPTD) of the Kenjeran Beach Amusement Park

An increase in the number of tourist visits would have an impact on increasing regional income from the Kenjeran Beach Amusement Park. Thus, this increase indicates that this tourist attraction is in demand mostly by domestic tourists. Opportunities for community-based tourism development are increasingly wide open with the positive indicators of the progress of this tourist attraction. On the other hand, in terms of the socio-economic situation of the surrounding area, namely Kelurahan Kenjeran and Kelurahan Sukolilo, the presence of the tourist attraction has not been able to drive every potential of the community to capitalize on the presence of the tourist attraction in their area more productively. There were a number of underlying factors, including the lack of confidence and sound business planning to boost the economy in the tourism sector.

Another background related to this was that the female merchants around the tourist attraction were less confident to try new things and took a bit of risk. Rather, they preferred imitating and following the steps of other merchants. It was indicated by the lack of unique local commodities originating from their habits. Most of the community’s commodities focused on processed seafood and shellfish.

Overcoming this obstacle, it is necessary to intensify programs from the relevant government agencies or other parties to guide the community to find new business plans that are unique, creative and worth selling while utilizing local resources. The synergistic programs from the Community Empowerment and Family Planning Agency, the Culture and Tourism Office, and the Marine and Fisheries Office, by collaborating with universities or other institutions, to further mobilize the economic potential of the community around the Kenjeran Beach Amusement Park is of significance.

The cooperative actions of the apparatuses of Kelurahan Kenjeran and Kelurahan Sukolilo are positive that need to be maintained and improved in a more concrete work program. The presence of the BKM and LKMK of Kelurahan Kenjeran, for example, seemed to be able to dynamize government programs within the community. Likewise, the linkage of these institutes with the existence of female merchants in the vicinity of the Kenjeran Beach Amusement Park constitutes an institutional form capable of establishing a synergy among merchants and between merchants and the management of the Kenjeran Beach Amusement Park.

Questionnaire Results

We will present the results of the questionnaire that was filled by the visitors of the Kenjeran Beach Amusement Park. Distributed this questionnaire during holidays. With the hope of getting respondents from all walks of life. in the first group, the description of respondents can be distinguished in terms of age, gender and occupation. For the second group, we describe

respondents in terms of housewives, employees, retiree and others. In the final classification, we focus on the issue of expenditure.

Table 3
 Description of Respondents (1)

Description	Gender		Age (years)				Last education			
	Male	female	20-30	31-40	41-50	> 50	Elementary School	Junior High School	Senior High school/ Vocational School	D1-bachelor degree
Total	52	68	55	47	11	7	5	9	83	23

Table 4
 Description of Respondents (2)

Description	Occupation					
	Housewife	Private employee	Government employee	Self-employed	Retiree	Other
Total	45	43	4	21	1	6

Table 5
 Respondents' Expenditures in the Kenjeran Beach Amusement Park

Description	Total Expenditures			Types of Expenditure		
	<IDR 50,000	IDR 50,000–100,000	>IDR 100,000	Souvenirs	Entertainment	Souvenirs & Entertainment
Total	33	52	35	29	12	79

The questionnaire, completed by 120 respondents, was divided into 2 categories of statements of, first, those related to the tourist attractions of the Kenjeran Beach Amusement Park (10 items). The items in this section elaborated the implementation of the *Sapta Pesona Wisata* values in the Kenjeran Beach Amusement Park (safety, cleanliness, orderliness, coolness, beauty, hospitality, and provision of memorable memories to tourists). Most respondents agreed to the following statements. With regard to the first statement that the Kenjeran Beach Amusement Park is an attractive tourist attraction, 21 respondents strongly agreed, 87 respondents agreed and 12 respondents disagreed. For the second statement that the Kenjeran Beach Amusement Park is a pleasant tourist attraction, 24 respondents strongly agreed, 86 respondents agreed, 8 respondents disagreed and 2 respondents strongly disagreed. With regard to the third statement that the Kenjeran Beach Amusement Park is gated, 16 respondents strongly agreed, 77 respondents agreed, 26 respondents disagreed, and 1 respondent strongly disagreed. For the fourth statement that traveling in the Kenjeran Beach Amusement Park is favorable, 13 respondents strongly agreed, 86 respondents agreed, and 21 respondents disagreed. For the fifth statement regarding recommending others to travel to the Kenjeran Beach Amusement Park, 30 respondents strongly agreed, 79 respondents agreed, 9 respondents disagreed, and 2 respondents strongly disagreed. With regard to the sixth statement concerning the beach attractiveness of the Kenjeran Beach Amusement Park, 30 respondents strongly agreed, 80 respondents agreed, and 10 respondents disagreed. For the seventh statement that the Kenjeran Beach Amusement Park is well managed, 16 respondents strongly disagreed, 77 respondents agreed, 25 respondents disagreed, and 2 respondents strongly disagreed. With regard to the eighth statement concerning the cost efficiency of traveling in the Kenjeran Beach Amusement Park, 40 respondents strongly agreed, 79 respondents agreed, and 1 respondents disagreed. For the ninth statement that the people around the Kenjeran Beach Amusement Park are friendly, 21 respondents strongly agreed, 88 respondents agreed, 9 respondents disagreed, and 2 respondents strongly disagreed. However, respondents also highlighted the weakness of the Kenjeran Beach Amusement Park by doubting the quality of cleanliness around the tourist area, in which 7 respondents strongly agreed, 47 respondents agreed, 56 respondents disagreed, and 10 respondents strongly disagreed.

The second category of statements related to the merchants around the Kenjeran Beach Amusement Park area (7 items). Most respondents agreed with all statements related to the implementation of community-based tourism in the Kenjeran Beach Amusement Park. Those statements related to the existence and performance of female merchants in the Kenjeran Beach Amusement Park area. With regard to the first statement concerning the availability of traditional foods with authentic flavors and supplemented with neat eating places, 38 respondents strongly agreed, 76 respondents agreed, and 6 respondents disagreed. For the second statement regarding the availability of attractive and unique food souvenirs, 31 respondents strongly agreed, 81 respondents agreed, 7 respondents disagreed, and 1 respondent strongly disagreed. For the third statement regarding the availability of attractive and unique souvenirs (handicrafts), 39 respondents strongly agreed, 80 respondents agreed, and 1 respondent disagreed. With regard to the fourth statement that the merchants in the Kenjeran Beach Amusement Park are well organized, 19 respondents strongly agreed, 68 respondents agreed, 30 respondents disagreed, and 3 respondents strongly disagreed. For the fifth statement that the merchants in the Kenjeran Beach Amusement Park are creative, 21 respondents strongly agreed, 91 respondents agreed, 6 respondents disagreed, and 2 respondents strongly disagreed. With regard to the sixth statement that the merchants in the Kenjeran Beach Amusement Park reflect strong women, 30 respondents strongly agreed, 77 respondents agreed, 11 respondents disagreed, and 2 respondents strongly disagreed. For the seventh statement that the merchants in the

Kenjeran Beach Amusement Park are friendly, 21 respondents strongly agreed, 88 respondents agreed, 6 respondents disagreed, and 5 respondents strongly disagreed.

Opportunities for the development of community-based tourism in the Kenjeran Beach Amusement Park are predicted to last a long time, due to the characteristics of the Kenjeran Beach Amusement Park as a family tourist attraction. This has its own advantages since most tourist sites that have a captive market of family tourist segment are more sensitive and aware of the people's economy, relative to those with characteristics of tourists of other segments (business, for example), which are managed in such a way that it seem to marginally absorb the products and resources of local communities.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The conclusions of the present study are as follows:

1. Community-based tourism (CBT) has been run by the management of the Kenjeran Beach Amusement Park by providing opportunities, convenience and facilitation to local residents (women) to trade in the tourist area.
2. The entrepreneurial spirit and practice of female merchants in the Kenjeran Beach Amusement Park were undertaken in a simple pattern, without a development design that provides direction for the business scale progress.
3. The merchant association in the Kenjeran Beach Amusement Park served as the mediator between the management and the merchants to maintain a good relationship and partnership.
4. The entrepreneurship assistance and development program as a way to develop and provide more value for the implementation of community-based tourism has not been running systematically and sustainably. Assistance from related parties to develop the business scale and to direct and to strengthen entrepreneurial enthusiasm and practice among the female merchants of the Kenjeran Beach Amusement Park accompanied by measurable success indicators of the program was not yet evident.
5. Gender equality as measured by the indicator of business freedom for women was evident in the Kenjeran Beach Amusement Park. However, this positive condition has not yet been accompanied by a systematic and sustainable human resources development and quality improvement program.

Recommendations

Several important recommendations to be followed up from the present study are as follows:

1. There is need for a systematic and sustainable human resources development and quality improvement, which is focused on structuring the business management and on the entrepreneurial spirit;
2. The Kenjeran Beach Amusement Park should continue to be managed by the Government of Surabaya City. This is because, as the merchants worried about and based on observations in several tourist sites, when the management (and ownership) of a tourist attraction is transferred from the Government to a private investor, there is a probability of the merchants' concerns and the implementation of community-based tourism will shift to game and market competition. Merchants who can trade in tourist sites will shift from local residents to residents of other regions with adequate capital to pay land rent and other costs. In order to prevent from such an alarming decision or condition, in addition to the Surabaya City Government's political commitment required, there are also the needs for the merchants' (and local residents') seriousness and hard work to maintain and improve the quality of the Kenjeran Beach Amusement Park.

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Effect Of Effective Microorganism Treated Grass Hay Supplementation On Feed Intake, Digestibility And Growth Performance Of Washera Sheep Fed Natural Grass Hay As A Basal Diet

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Abstract- The experiment was carried out to evaluate the effect of Effective Microbes (EM) treated grass hay on feed intake, digestibility, growth performance and economic feasibility of Washera sheep fed on natural grass hay basal diet. Twenty Four growing (8-9 month) intact male Washera sheep with initial body weight of 14.802±1.965kg (mean ± SD) were blocked in to six blocks based on initial body weight and animals within a block randomly assigned to treatment diets. Treatments were ad libitum feeding of grass hay (T1) and grass hay ad libitum supplemented with 5%, 10% and 20% of total dry matter intake Effective Microbes treated hay for T2,T3,and T4, respectively. All sheep were supplemented with 100 g Noug seed cake (NSC) to fulfill maintenance requirement of sheep. Animals were allowed with ad libitum access to water and salt. The experiment consisted of 90 days feeding and 10 days of digestibility trials in that order. Hay contained 6.56% crude protein, 75.42% Neutral Detergent Fiber and 57.45% Acid Detergent Fiber whereas Effective Microorganism (EM) treated hay contained 10.91% crude protein, 60.62% Neutral Detergent Fiber and 42.35% Acid Detergent Fiber. Sheep in T1 consumed significantly ($p<0.0001$) lower total dry matter intake (541.57g/day) compared to T3 and T4 (583.53 and 630.18g/day total dry matter intake, respectively). The crude protein intake ranged 59.88 to 70.38 g/day and was lower for T1. The highest digestibility of dry matter and nutrients were, recorded in sheep fed T3 EM treated hay supplemented group compared to the rest treatments supplemented groups. Average daily gain (ADG) was significantly ($p<0.0001$) higher in supplemented group than the control group and among supplemented groups the highest Average daily gain (ADG) was recorded in sheep fed T3. Similarly, high net return was obtained in T3 with value being 290.56 followed by T4 (82.87ETB/sheep). In conclusion, 10% Effective Microorganism (EM) treated hay used in this study showed significantly highest values in almost all parameters. Therefore, 10% Effective Microorganism (EM) treated hay could be recommended to be used in low quality feeds for improving nutritional value, apparent digestibility and market condition of Washera sheep.

Index Terms- Digestibility, Effective Microorganism, feed treatment, Growth, Intake, Washera Sheep

I. INTRODUCTION

Ethiopia is a home for many livestock species and is believed to have the largest livestock population in Africa. According to Central Statistical Agency data (CSA, 2018) the country is a home for about 60.34 million cattle, 31.30 million sheep, 32.74 million goats 1.42 million camels, 56.06 million poultry, 2.01 million horses, 0.46 million mules and 8.85 million donkeys. From the total cattle population 98.24% are local breeds and the remaining are hybrid and exotic breeds that accounted for about 1.54% and 0.22%, respectively. Sheep production in Ethiopia plays a very important role in contributing to the food security, domestic meat consumption and generating cash income as well as providing continuous service to the economic stability of smallholder farmers (Alemu, 2008). Smallholder farmers depend on sheep for much of their livelihood, often largely than on cattle (ESGPIP, 2009).

Although there exists large number of sheep population in Ethiopia the production and productivity is very low as expressed by annual population growth rate of 1% and off-take rate of 35% (CSA, 2018). Performance of sheep in terms of body weight gain and carcass production is low. The low performance of local sheep is mainly due to inadequate nutrition both in quality and quantity. The limitation in production due to shortage of feeds and poor nutrition is usually profound in areas where high seasonal dynamics in feed sources, fragile ecologies and environments exposed degradation. Moreover, a great majority of feeds are roughages with low feed values. Improving feeds and nutrition through technologies is important to boost the overall productivity, health, and well-being of sheep flocks (Chernet, 2012). In this regard, use of effective microbes (EM) for better utilization of roughages is thus imperative (Safalaoh *et al.*, 2001).

The use of EM to small ruminant is very limited in Ethiopia and in particular in the study area. Currently the price of concentrate feeds are high as expressed by (FAO, 2009) therefore, using non-conventional supplements like EM can help to minimize the current towering price of concentrates, through rumen manipulation and efficient utilization of available fibrous feed materials. The lactic acid bacteria, in EM contribute to the fermentation and breakdown of the tough cellulose and lignin

materials in the feed. Moreover, the report from this study was expected to narrow down the difference and skeptical outlooks towards the use of EM as animal feed in the study area, especially to small ruminant. Thus, the objective of this study was designed to evaluate the effect of effective microbes (EM) treated grass hay supplementation on feed intake, digestibility and growth performance of Washera sheep with assessing its economic feasibility.

II. MATERIALS AND METHODS

2.1. Description of the Study Area

The study was conducted in Burie, kebele 03, West Gojam Administrative Zone, Amhara National Regional State, Ethiopia. The geographical location of the study area is 10°42'29"N latitude and 37°7'9"E longitude at a distance of 400 km North West of Addis Ababa and 148 km south west of Bahir Dar, the capital of Ethiopia and Amhara National Regional State, respectively. The altitude of the study area is 2604 m.a.s.l (IPMS, 2014). The mean annual rain fall is 1689.4 mm and the mean annual temperature value is 18.5°C (IPMS, 2014).

2.2. Experimental Animal Management

For the feeding experiment, twenty-four growing (8-9 months age) intact male Washera sheep with initial body weight of 14.802 ± 1.965kg (mean ±SD) were purchased from Dangla town. The age of the animal was determined by asking their back ground history and by their dentation. Animals were quarantined for 21 days and they were vaccinated for common diseases of the area (Anthrax, sheep pox and Pasturelosis), injected with oxy tetracycline 20% (0.2 mg/kg) and dewormed with Deoxamine (300 mg/kg) against endoparasites. Each sheep was ear tag for identification purpose and ease of record keeping.

At the end of the quarantine period, sheep were penned individually in a well-ventilated house, which was equipped with feeding and watering troughs. The hay and the supplement feeds were provided in separate containers. Baskets made of bamboo were used for the feeding of hay, while the concentrate and water were offered in plastic bowl. Before the commencement of the actual data collection, animals were acclimatized to experimental diets for 15 days.

2.3. Experimental Diet Preparation

Natural Grass hay was purchased from farmers directly from their farm. The hay was stored properly to keep its quality. Noug seed cake and EM were purchased from the nearby local market called 'Kuch' and Bahir Dar Agricultural raw material Center, respectively. Grass hay was hand chopped at 4-5cm length and EM solution was prepared at a ratio of 1:1:18 by volume of stock EM, molasses and chlorine free water, respectively (EMROSA, 2006). The water was warmed to about body temperature and the molasses was stirred until dissolved. After mixing the stock EM with water and molasses, it was poured onto the grass hay slowly in small quantities and thoroughly mixed by hand until it was just moistened throughout so that no moisture comes out of it when squeezed by hand.

To achieve optimum moisture content, 20 liter of EM solution was poured for 60 kg grass hay. The moistened grass hay was then pressed in an air tight sack, with as much air as possible

being pressed out before closing it. The filled sack was left in a warm, dark place to ferment for twenty-eight days as per the recommendations of EMROSA (2006). Then untreated grass hay was offered to all animals *ad libitum* as a basal diet by allowing 20% refusal whereas, the EM treated grass hay and NSC were offered twice a day at 8:00 am and 4:00 pm in equal portions. The EM treated grass hay was adjusted every ten days by taking the average total dry matter intake. All animals had free access to water and salt lick. The treatment diets were arranged as presented in Table 1.

Table1

Treatment	Basal diet (grass hay)	Supplements
T1	<i>ad libitum</i>	100g NSC
T2	<i>ad libitum</i>	EM treated grass hay at 5% of TDMI+ 100gNSC
T3	<i>ad libitum</i>	EM treated grass hay at 10% of TDMI+ 100gNSC
T4	<i>ad libitum</i>	EM treated grass hay at 20% of TDMI+ 100gNSC

EM = effective microbes; TDMI = Total dry matter intake; NSC = Noug seed cake

2.4. Experimental design

A randomized complete block design (RCBD) with four treatments, each replicated six times was used for this experiment. The experimental animals were grouped into six blocks of four animals each based on their initial body weight (IBW) which was determined by taking the averages of two consecutive weighing after overnight fasting of the animals at the end of the quarantine period. Animals in a block were then randomly assigned to one of the four experimental treatment feeds making six animals per treatment.

2.5. Feeding trial

The feeding trial lasted for 90 days. Experimental feeds offered and the corresponding refusals were recorded daily to determine daily feed intake. Daily feed intake was determined as the difference between feed offered and refused. Samples of feeds offered and refusals were taken every day and pooled per feed basis for feed offer and per treatment for the refusal. At the end of the experiment, pooled feed and refusal samples were thoroughly mixed and sub sampled for chemical analysis. The metabolize energy MJ/day intake was estimated from digestible organic matter intake (DOMI) values by using the equation of AFRC (1993).

ME (MJ/d) = 0.0157*DOMI g/kg DM. where: DOMI is digestible OM intake (in gram per kilogram DM)

Where; DOMI was the product of OMI and its digestibility coefficient.

Substitution rate (SR) of the basal feed with the supplements in the supplemented treatment was calculated as:

SR= Basal diet DMI of the control treatment- Basal diet DMI of the supplement treatment

Supplement DMI

Where: DMI= Dry matter intake

Body weight of each animal was measured for two consecutive days at the beginning of the experiment and every 10 days intervals during the 90 days of feeding period after overnight fasting by using portable electronic weighing scale. The average weight of the two consecutive days weighing of the beginning and last dates of the experimental period were taken as the initial and final body weights, respectively. Body weight change was calculated as the difference between final live weight and initial live weight while Average daily body weight gain was computed as body weight change divided by the number of experimental days. Weights recorded at an interval of 10 days were used to show trends of body weight change during the feeding trial period.

2.6. Digestibility trial

The digestibility trial was conducted after the feeding trial with the same animals used for feeding trial. All animals were harnessed with fecal collection bags for the determination of digestibility. The digestibility trial took a total of 10 days with three days of adaptation of carrying the fecal bags. After three days of adaptation, daily total fecal output along with the daily feed offered and refusal were weighed and recorded for seven consecutive days for each animal. Out of the daily total fecal output, 20% was sub-sampled to form a weekly fecal composite sample for each animal and stored at -20°C . Fecal samples were then thawed, thoroughly mixed, subsampled, dried at 60°C for 72 hours and ground to pass 1 mm sieve screen and stored pending chemical analysis. Grabs of feed samples from each feed and refusals from each animal were collected each day to make a weekly composite feed sample for each feed and refusal per treatment. The apparent digestibility coefficient of DM and nutrients were calculated as:

$$\frac{\text{Apparent Dry Matter Digestibility (\%)}}{\text{Dry matter intake - Dry matter in faces}} * 100$$

$$\frac{\text{Apparent Nutrient Digestibility (\%)}}{\text{Nutrient intake - Nutrient in faces}} * 100$$

2.7. Chemical analysis

Representative samples of feeds, refusals and faces were taken to Debre Birhan Agricultural Research Center Nutrition Laboratory for chemical analysis. The samples were dried in a forced draft oven at 60°C for 72 hours and ground to pass through a 1mm screen sieve using a mill. The ground sample was stored in an airtight plastic bag pending chemical analysis. Dry matter (DM), ash and CP content of sample of feed offered, refused and feces were analyzed by the method of AOAC (1990). Neutral detergent fiber (NDF), acid detergent fiber (ADF) and acid detergent lignin (ADL) in the samples of feeds that were offered, and from refusals and faces were determined by the method of Van Soest and Robertson (1985). Organic matter (OM) was calculated as ash deducted from hundred.

2.8. Partial Budget Analysis

Partial budget analysis was determined to assess the profitability of the feeding regime. To estimate the economic

benefits of supplementation of effective microbes and molasses solution treated grass hay for sheep, the calculations were done according to Upton (1979). Total return (TR) was calculated as the difference between selling and purchasing price of the experimental animals. Net income (NI) was calculated as the amount of money left when total variable cost (TVC); purchasing price of sheep, feed cost and treatment costs are subtracted from total returns (TR);

$$NI = TR - TVC \text{ or } NR = TR - TVC$$

The change in net income (ΔNI) will be calculated as the difference between the change in total return (ΔTR) and the change in total variable costs (ΔTVC);

$$\Delta NI = \Delta TR - \Delta TVC \text{ or } \Delta NR = \Delta TR - \Delta TVC$$

The marginal rate of return (MRR) measure the change in net income (ΔNI) associated with each additional unit of expenditure (ΔTVC) and expressed in percentage as;

$$MRR = (\Delta NI) / (\Delta TVC) \times 100$$

2.9. Statistical Analysis

The data were analyzed using the General Linear Model (GLM) procedures of the Statistical Analysis Software (SAS, release 9.1, 2008) for analysis of variance (ANOVA). The six blocks per treatment were used to increase the precision of the experiment by reducing the residual error. Treatment means were separated using least significant difference (LSD). Statistical significance was established when probability is ≤ 0.05 level of significance. The model used for analysis was; -

$$Y_{ij} = \mu + t_i + b_j + e_{ij}$$

Where:

Y_{ij} = Response variable

μ = overall mean

t_i = the effect of the i^{th} treatment

b_j = the effect of the j^{th} block

e_{ij} = Random error

III. RESULTS AND DISCUSSION

3.1. Chemical Composition of Treatment Feeds

The chemical composition of the treatment feeds and hay refusals are given in Table 2. The CP value recorded for hay used in the current study was lower and indicates that the basal feed has a poor nutritional potential and may fail to support the maintenance requirements of sheep as it contains CP below the minimum level (7%) required for microbial function (Van Soest, 1994). The CP content of hay refusals showed relatively similar among the four treatment feeds. However, the hay offered had higher CP but lower NDF, ADF and ADL values than the hay refusals. This may be due to the fact that experimental sheep selected more edible portions of the basal diet and left the fibrous parts of the grass which has higher structural constituents (NDF, ADF and ADL) fractions.

Table2

Chemical composition (% for DM and %DM for others) of experimental feeds and hay refusals

Feeds	DM	OM	CP	NDF	ADF	ADL
Hay	92.00	91.83	6.56	75.42	57.45	14.42
EMTH	67.68	93.61	10.91	60.62	42.35	12.40
NSC	93.00	92.77	30.91	52.4	35.05	8.46
EM treated hay refusals						
T2	63.92	93.87	4.56	65.44	49.39	13.4
T3	64.17	93.70	5.66	64.44	46.67	13.27
T4	66.03	93.74	5.19	64.44	46.67	13.27
Hay refusals						
T1	91.00	92.62	4.5	78.45	66.16	14.57
T2	90.00	92.55	3.81	77.77	63.83	14.43
T3	94	92.78	3.66	77.26	61.55	14.43
T4	93.00	92.70	3.81	76.52	60.17	14.47

DM= dry matter; OM= organic matter; CP= crude protein; ADF= acid detergent fiber; NDF= neutral detergent fiber; ADL= acid detergent lignin; EMTH= Effective Microbes treated hay; NSC= Noug Seed Cake; T1= grass hay+100g NSC; T2= grass hay+5%EMTH+100g NSC; T3= hay+10% EMTH+100gNSC; T4= grass hay +20%EMTH+100 g NSC.

The CP content of hay used in the current study was relatively comparable to the CP content of 6.04%, 6.23%, 6.56% and 6.8%, reported by Michael *et al.* (2017), Birhanu (2013), Simret (2005) and Abadi *et al.* (2014), respectively and lower than the CP content of 7.01%, 7.2% and 7.2% reported by Berhanu *et al.* (2014), Desta *et al.* (2017) and Lemma *et al.* (2018), respectively, but higher than the CP contents of 3.56%, 3.73%, 3.75% and 4.2% reported by Fentie (2007), Berhan and Asnakew (2015), Asnakew (2005) and Mulu (2005), respectively. The differences in CP content of hay among the various studies could be due to the factors like the species composition of the hay, environmental factors in which the hay was grown, and stage of maturity at which the hay was harvested (Chrenkova *et al.*, 2006; Dereje, 2015).

Neutral detergent fiber content above 55% was reported to limit DM intake and hence directly interfere with the productivity of animals (Van Soest, 1985). In this regard, the NDF value (75.42%) of hay in the current study was found to be high and it was comparable to 73.48% and 76.5% NDF for natural pasture hay previously reported by Amde (2015) and Michael *et al.* (2017), respectively. But it was lower than 79.4% and 80.87% reported by Shashie *et al.* (2017) and Awoke (2015), respectively for natural pasture hay and it was higher than, 70.67 and 71.8% reported by Asnakew (2005) and Getachew (2005), respectively.

The CP and OM content of EM treated hay in the current study was higher but NDF, ADF and ADL components were low compared to the untreated hay. This difference might be due to the fermentation effect of plant cell wall components by effective microbes and the synthesis of microbial protein. Similarly, EM

treated hay refusals were found to contain lower CP and higher fiber (NDF, ADF and ADL) fractions. In the current study, it was clearly observed that effective microbes improve the crude protein content of low quality grass hay. The current result agree with the results of Mulugeta (2015) who reported treating crop residue by EM resulted a decrease in NDF and ADF content but slightly increase the CP content.

The CP content of NSC used in the current study was similar with the value 30.57% reported by Lemma *et al.* (2018) but higher than the values 28.2% and 29.12% reported by Gezu *et al.* (2017) and Birhanu (2013), respectively. But lower than the values 34.65% and 36.2% reported by Dessie *et al.* (2019) and Shashie *et al.* (2017). The variation in CP contents of NSC in different studies might be due to the difference in variety of Noug seed, soil and the agro-ecology where the crop grown and the effectiveness of the oil extraction factories during the processing (Abadi, 2014). The NDF value of NSC in the current study was slightly comparable to 56.84% reported by Abadi (2014) but higher than the values 40.78% and 41.3% reported by Dessie *et al.* (2019) and Worknesh and Getachew (2018), respectively.

3.2. Dry Matter and Nutrient Intakes

The mean daily total DM and nutrient intakes for Washera sheep are presented in Table 3. In the current study basal dry matter intake was none significantly different (P>0.05) among treatment groups. But there was, highly significant difference (p<0.0001) in total dry matter intake among treatments with the highest value (630.18 g/day/animal) recorded for T4 and the least values (541.57) and (553.30 g/sheep/day) were recorded for T1 and T2, respectively. Generally, total daily DM intake showed an increasing trend with increasing the level of EM treated grass hay from T1 to T4

Table3

Daily dry matter and nutrient intake of Washera sheep fed natural pasture hay supplemented with EM treated hay at different proportions.

Paramet ers	Treatm ents				SE M	p value
Dry matter intake	T1	T2	T3	T4		
Hay (g/d)	441.57	425.39	425.34	416.70	19.02	0.082
EMTH (g/d)	0 ^d	27.914 ^c	58.199 ^b	113.479 ^a	7.17	<0.001
NSC (g/d)	100	100	100	100	-	-
Total DMI (g/d)	541.57 ^c	553.30 ^c	583.53 ^b	630.18 ^a	21.98	<0.001
DMI (%BW)	3.51 ^a	3.34 ^a	2.90 ^b	3.32 ^a	0.29	0.0106
DMI (g/kg BW ^{0.75})	69.56 ^a	67.27 ^a	61.41 ^b	69.13 ^a	4.17	0.0107
Nutrient intake (g/d)						
ME (MJ/d)	4.69 ^c	5.5 ^b	7.22 ^a	7.1 ^a	0.25	<0.001

OM	498. 26 ^c	509.5 3 ^c	537.84 ^b	581.6 5 ^a	20.2 7	<0.00 01
CP	59.8 8 ^c	61.86 c	65.16 ^b	70.63 ^a	1.66	<0.00 01
NDF	385. 43 ^c	390.1 5 ^c	408.47 ^b	435.4 7 ^a	15.8 9	0.000 2
ADF	288. 73 ^c	291.2 6 ^{bc}	304.06 ^b	322.5 0 ^a	11.9 5	<0.00 07
Substitution rate	-	0.58 ^a	0.28 ^b	0.22 ^b	0.19	0.000 3

^{abcd} means with different superscripts in a row are significantly different at $P < 0.05$. SEM=standard error of mean; OM= organic matter; CP= crude protein; ADF= acid detergent fiber; NDF= neutral detergent fiber; EMTH=Effective microbes Treated Hay; NSC= Noug Seed Cake: T1= grass hay + 100g NSC; T2=grass hay+5% EMTH+100gNSC; T3= grass hay+10% EMTH +100g NSC; T4= grass hay +20% EMTH +100g NSC.

This trend is in line with the report of Deribe *et al.* (2017) who reported that the total DM intake of animals was increased with increasing level of Effective Microorganism (EM). In contrast to the current finding, Chernet (2012) reported that there was a fall in total DM intake as EM-Bokash inclusion in the diets increased from 1 to 5%. Higher total DM intake in the supplemented groups is related to the favourable rumen environment, such as microbial growth, production of fiber degrading enzymes, which could have been resulted in enhanced fermentation, rate of break down and rate of digestion of the feed and resulted in a greater DM intake (McDonald *et al.*, 2010).

The least total DM intake recorded for the sheep kept on natural grass hay (T1) was probably due to the low colonization of microorganisms in the rumen and the retention of fiber contents in the rumen for long time which is likely depressing both feed intake and digestibility. One of the factors that affect forage and concentrate intake and digestibility is the microbial density in the rumen. Effective fiber colonization of microbes in the rumen reduces the retention time of fiber components due to production of fiber degrading Enzymes (Walker, 2007; Seo *et al.*, 2010).

In the current study Metabolizable energy intake of sheep under supplemented groups showed significantly ($p < 0.0001$) higher values than the control group but with similar values for T3 and T4. The ME intake of sheep in the current study indicated higher values required for maintenance (3.7-4.1 MJ/day/sheep) estimated for a 20 kg lamb (ARC, 1980). The current result was similar with the results of Worku *et al.* (2016) who reported presence of significant difference through supplementation of 5% EM-Bokash compared to the unsupplemented group. The ME intake values (4.6-7.2 MJ/day) in the current study were within the range of 4.3-7.8 MJ/day/animal for Washera sheep fed urea treated finger millet straw and supplemented with non-conventional feeds (Melese *et al.*, 2014).

On the other hand, significantly ($P < 0.0001$) higher intake values of OM, CP, NDF and ADF were observed in T4, compared to the rest of the treatments. The higher microbes contend in the supplemented feeds compared to the basal diet might be result higher microbial protein synthesis in the supplemented groups. According to Ranjhan (1997), the average daily protein and energy requirement for maintenance of the sheep weighing 30 kg was

reported to be 36 g and 4.017 MJ ME, respectively. This indicated that both the supplemented and control sheep in this study had CP intake beyond their maintenance requirement above which protein being used for body weight gain purposes. Significant differences were also observed in OM, CP and NDF intake among the supplemented groups with the highest value recorded for T4.

Total DM intake values expressed as percent of body weight in this study fall in the range of 2.90 to 3.51% as expressed in (Table 3). T3 had significantly ($p < 0.05$) lower dry matter intake as percent of body weight than the other treatment groups. The lower dry matter intake as percent of body weight in T3 might be due to higher feed conversion efficiency and which in turn results in higher body weight gain. The total DM intake as percent of body weight of this trial was comparable with the values 2.8 to 3.1% BW reported by Wondwosen *et al.* (2013) for Washera sheep fed natural pasture hay supplemented with 300g concentrate mix with *Sesbania sesban* at different proportions. On the other hand, total DM intake as percent of body weight of the current study was lower than the values of 3.3 to 3.9% BW reported by Melese *et al.* (2014) for the same breed fed urea treated finger millet and supplemented with non-conventional feeds. The differences in Total DM intake values as percent body weight are arising from the variation in the nutrient composition, feed intake and body weight of the animals. The total DM intake in the present study was in the range of the recommended dry matter intake (2-4%) for sheep and goat (Susan, 2009).

The total DM intake per unit of metabolic body weight in the present study ranged between 61.41g to 69.56 g/kg BW^{0.75}. Sheep under T3 consumed significantly ($P < 0.05$) lower DM per unit of metabolic body weight as compared to the other supplemented groups. The variation might be due to the high body weight gain of the experimental sheep in T₃ (Table 5) and the efficient utilization of feeds per unit of their metabolic body weight. The total DM intake per unit of metabolic body weight of this trial was comparable with the values 56.10-65.59g/kg BW^{0.75} for Washera sheep fed urea treated rice straw and supplemented with graded level of concentrate mix (Abebe, 2017). But lower than the values 76.2-88.9 g/kg BW^{0.75} reported by Mesganaw (2014) on total DM intake per unit of metabolic body weight for the same breed.

In the current study, substitution rate of natural pasture hay with supplement of EM treated hay was observed at the rate of 0.22, 0.28 and 0.58 for T4, T3 and T2, respectively. Generally, it has been known that amount of supplement can affect substitution rate.

3.3. Dry Matter and Nutrient Digestibility

The apparent digestibility of dry matter and nutrients for the experimental animals are given in Table 4. The apparent digestibility of DM, OM, CP, NDF and ADF were highly significantly ($p < 0.0001$) higher in T3 than the rest treatment groups but no difference ($p > 0.05$) was noted between T1 and T2 in DM, CP and NDF digestibility and between T2 and T4 in CP and NDF digestibility. On the other hand, there were highly significant ($p < 0.0001$) difference between T1 and T2 in OM and ADF digestibility and between T2 and T4 in DM, OM and ADF digestibility. There were also highly significant ($p < 0.0001$) difference among T3 and T4 in DM, OM, CP, NDF and ADF digestibility with the highest digestibility value recorded for T3.

The digestibility improvement observed in T3 as compared to the rest of the treatment groups might be due to optimum microbial supplementation level and efficient production of fiber degrading enzymes by effective microorganisms. On the other hand, the low level of DM digestibility observed in T2 might be due to the low level of microorganism supplementation to degrade plant cell wall components whereas the moderate digestibility improvement

observed in T4 might be due to higher by pass rate (i.e. high nutrient balance). Addition of effective microbes on feeds increased microbial population in the rumen to support optimum ruminal activity and balance nutrient intake and nutrient loss through feces (Jalc, 2002).

Table 4

Apparent digestibility of dry matter and digestible nutrient intakes of Washera sheep fed natural pasture hay and supplemented with Effective Microbes treated hay at different proportions

Digestibility (%)	Treatments				SEM	P value
	T1	T2	T3	T4		
DM	51.81 ^c	57.63 ^c	79.77 ^a	68.15 ^b	7.69	<0.0001
OM	59.97 ^d	69.38 ^c	85.49 ^a	77.78 ^b	5.71	<0.0001
CP	82.39 ^c	83.79 ^{bc}	90.55 ^a	84.74 ^b	1.65	<0.0001
NDF	50.17 ^c	57.70 ^{bc}	82.68 ^a	65.83 ^b	8.42	<0.0001
ADF	44.49 ^d	57.82 ^c	83.26 ^a	71.97 ^b	8.08	<0.0001
Digestible Nutrient intake (g/day)						
DM	280.59 ^d	318.87 ^c	465.48 ^a	426.73 ^b	14.02	<0.0001
OM	298.81 ^c	353.52 ^b	459.80 ^a	452.41 ^b	15.94	<0.0001
CP	49.33 ^c	51.83 ^b	59 ^a	59.63 ^a	1.41	<0.0001
NDF	193.37 ^d	225.12 ^c	337.72 ^a	286.67 ^b	9.82	<0.0001
ADF	128.46 ^d	168.41 ^c	253.16 ^a	232.10 ^b	7.55	<0.0001

^{abcd} means with different superscripts in a row are significantly different (P<0.05; DM= dry matter; OM= organic matter; CP= crude protein; ADF= acid detergent fiber; NDF= neutral detergent fiber; ADL= acid detergent lignin; EMTH= Effective Microbes treated hay; NSC= Noug Seed Cake; T1= grass hay+100g NSC; T2= grass hay+ 5%EMTH+100g NSC; T3= hay+10% EMTH+100gNSC; T4= hay +20%EMTH+100 g NSC.

The low digestibility of DM observed in T1 might be related to the low CP, high NDF and ADF content of hay. It was noted that feeds with DM digestibility less than 55% is considered as poor quality and will not maintain body weight, whereas feeds having DM digestibility exceeding 65% is categorized as high quality (David, 2007). Hence, based on the results of current study, supplementation of sheep with effective microbes treated hay at the level of 10% had high potential to improve the digestibility of nutrients and dry matter by producing optimum level fiber degrading enzymes in the rumen. Similar to the present study, Samsudin *et al.* (2013) reported improved digestibility of DM, OM, CP, NDF and ADF than the control group with EM treated rice straw supplementations. But the current study disagreed with the work of Chernet (2012), who reported absence of significant differences in the digestibility of DM and CP content by inclusion of EM treated wheat bran and solution into the concentrate feeds.

3.4. Body Weight Change and Feed Conversion Efficiency

Mean initial body weight, final body weight (FBW) average daily gain and feed conversion efficiency (FCE) are presented in Table 5. Initial body weight was similar among all

treatments (P>0.05). Supplemented groups, which offered 10% (T3) and 20% (T4) EM treated hay, had significantly higher (p<0.0001) FBW as compared to unsupplemented sheep but none significant difference (p>0.05) was observed between T1 and T2, T2 and T4, and T3 and T4. All supplemented groups had significantly higher BWC and ADG as compared to the control group. There was significant variation among supplemented groups in BWC and ADG with the highest value was recorded for T3 and the lowest value was recorded for T2.

due to the higher total DM intake and microbial protein synthesis in the rumen as compared to the control group. Among the supplemented treatments, significantly lower (P<0.001) records of BWC and ADG were observed in T2 which might be due to the lower microbial protein synthesis in T2 compared to T3 and T4. Body weight gain of (6.61 g/d) for T₁ animals indicated that a small amount of NSC supplementation resulted in alleviating the possible body weight loss of the animals. The result of the current experiment agrees with previous studies of Worku *et al.* (2016) in which supplementation of probiotics improved final body weight (FBW), BWC and ADG.

Table5

Body weight gain of Washera sheep fed natural pasture hay supplemented with EM treated hay at different levels

Parameter	Treatment				SEM	P value
	T1	T2	T3	T4		
IBW (kg)	14.92	14.63	14.75	14.92	1.965	0.99
FBW (kg)	15.51 ^c	16.74 ^{bc}	20.29 ^a	18.97 ^{ab}	1.99	0.0021
BWC (kg)	0.59 ^d	2.11 ^c	5.54 ^a	4.06 ^b	0.78	<0.0001
ADG (g/d)	6.61 ^d	23.48 ^c	61.56 ^a	45.06 ^b	8.70	<0.0001
FCE(gADG /gDMI)	0.013 ^d	0.043 ^c	0.11 ^a	0.07 ^b	0.015	<0.0001

^{abcd} means with different superscripts in a row are significantly different (P<0.05); T1= grass hay+100g NSC; T2= grass hay+5%EMTH+100g NSC; T3= hay+10% EMTH+100gNSC; T4= hay +20%EMTH+100 g NSC. IBW = initial body; FBW = final body weight; BWC=body weight change; ADG, average daily gain; FCE = feed conversion efficiency

Feed conversion efficiency values showed significant (P<0.0001) difference among treatment groups and was in the order of T3>T4 > T2>T1 (FCE). The highest value in sheep fed T3, diets which have higher digestibility values result in higher final body weight gain, average daily gain and feed conversion efficiency. On the other hand, the lowest FCE for the control group might be due to low level of microbes in the rumen which in turn resulted low level of fiber degrading enzymes and depressed digestibility and absorption of nutrients. The low feed intake contributed to the low body weight gain which consequently might have affected FCE.

Partial budget analysis of Washera sheep fed natural pasture hay and supplemented with Effective Microbes treated hay at different proportions is given in Table 6. The total return was in the order of T3>T4>T2>T1 and the least total income was gained from unsupplemented group (T1). These values were directly related with the weight gain of sheep but not with prices of experimental feeds. The net return 290.56, 82.87, 78.99 and 19 ETB/sheep were obtained from sheep fed T3, T4, T2 and T1, respectively. The gross financial margins 898.05, 1350.37 and 155.29 ETB/sheep were obtained from sheep fed T2, T3 and T4, respectively.

3.5. Partial Budget Analysis

Table 61

Partial budget analysis of Washera sheep fed natural pasture hay and supplemented Effective microbes treated hay at different proportions

Variables	Treatment			
	T1	T2	T3	T4
Sheep purchasing price(ETB/head)	1188	1188	1188	1188
Total Grass hay consumed (kg/head)	39.74	38.29	38.28	37.5
Total EM and molasses solution treated hay consumed (kg/head)	-	2.51	5.24	10.22
Total NSC consumed (kg/head)	9	9	9	9
Feed cost				
Cost for grass hay/kg (ETB)	4.50	4.50	4.50	4.50
Total cost for grass hay (ETB/head)	178	172.31	172.26	168.75
Cost for NSC/kg	10	10	10	10
Total cost for NSC/(ETB/head)	90	90	90	90
Cost for EM treated hay/kg (ETB)	-	4.93	4.93	4.93
Total Cost for EM treated (ETB /head)	-	12.37	25.83	50.38
Total feed cost (ETB/head)	268	274.68	288.11	309.13
Gross income (ETB/head)	1475	1541.67	1766.67	1580.0
Total return (ETB/head)	287	353.67	578.67	392
Net return (ETB/head)	19	78.99	290.56	82.87

Δ NR	-	59.99	271.56	63.87
ΔTVC	-	6.68	20.11	41.13
MRR (%)		898.05	1350.37	155.29

MRR= marginal rate of return; ETB= Ethiopian Birr; ΔNR= change in net return; ΔTVC= change in total variable cost; T1 : grass hay + 100g; T2= grass hay+100 g NSC +5% EMTH; T3=EMTH +100 g NSC+10%EMTH; T4= : hay +100 g NSC+20%EMTH

IV. CONCLUSIONS

Sheep fed T3 diet showed significant improvement in, DM and nutrient digestibility, FCE and body weight gain over the other treatment feed supplemented groups. Relatively, the highest net return and change in net return were obtained in T₃ (290.56ETB/sheep and 271.56ETB/sheep, respectively). While the highest change in total variable cost (ΔTVC) was recorded in T₄ (41.13ETB/ sheep) and the lowest in T2 (6.68 ETB/sheep). Supplementing of EM treated hay to the basal diet grass hay improved total DM and nutrient intakes, digestibility and feed conversion efficiency as compared to sheep in control group. EM treated hay supplemented at 10% of total diet (daily dry matter intake) resulted in highest weight gain and profit compared to 5% and 20% EM treated hay supplemented groups. Therefore, supplementing a 10% of EM treated hay could be used in low quality feeds for improving nutritional value, apparent digestibility and market condition of Washera sheep.

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Profiling Long-term Outcomes in children with Auditory Brainstem Implant

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Abstract- Auditory Brainstem Implant (ABI) is a bio-electronic device stimulating Cochlear Nucleus directly by-passing the inner ear and auditory nerve. ABI performed routinely in adults and children who are not candidates for CI. There is dearth of research available on documenting the long term outcomes concerning auditory comprehension and speech and language development in children with ABI. The present study focuses on profiling the long term holistic outcomes of ABI implantees. The Aim of the present study is to profile long-term outcomes in children with ABI with the minimum implant age of 3 years and above. This is a retrospective and prospective cohort of 13 children with unilateral ABI (mean age of 4.67 years) were included. The long-term subjective outcomes in various aspects such as auditory perception, auditory discrimination, auditory hearing performance, speech intelligibility and speech and language developmental skills were administered in children with the implant ages ranging from 3.6 to 10 years. The results showed the auditory performance scores were observed to gradually increase as the implantation age increases and also with improving hearing thresholds. Thus this result has highlighted ABI is an effective approach for the improvement of real-life adaptation and for different types of communication which in turn exhibits significant improvement when used over a longer period of time.

Index Terms- Auditory Brainstem Implant (ABI), Auditory perception, Auditory discrimination, Speech intelligibility

I. INTRODUCTION

The auditory faculty is the most sophisticated system of sense and is an important sensory system that serves a range of purposes from alertness to delivering information. Loss of hearing could be empowered with technologies such as hearing aids, however hearing restoration is made possible only with the development of hearing implants such as cochlear and auditory brainstem implants. The choice of management is dependent on

the degree, cause, and types of hearing loss. The Cochlear implants (CI) have revolutionized for the treatment of individuals with profoundly hearing loss and the important pre-requisite to undergo cochlear implantation is the presence of the cochlear nerve. CI has been contraindicated in some clinical instances such as inner ear anomalies and individuals with absent or deficit cochlear nerve. In such circumstances, the only option to restore hearing is by stimulating the regions beyond the cochlea and the cochlear nerve. Auditory Brainstem Implantation (ABI) is one such remedy to restore hearing for individuals with such condition. "ABI is an extension of the principle of cochlear implants. ABI involves direct stimulation of the secondary neurons of the relay nucleus (cochlear nucleus) in the brainstem" [Nakatomi, Miyawaki, Kin & Saito, 2016]

The basic functional mechanisms of an ABI are similar to those of a cochlear implant (CI). The CI provides electrical stimulation to the spiral ganglion neurons through an electrode array inserted into the scala tympani whereas, in ABI, the stimulation is given to the surface of the cochlear nucleus by the paddle-shaped electrode array. Both the CI and ABI devices use similar signal processing and the number of electrodes but vary primarily in stimulation location that is the cochlear nerve versus cochlear nucleus. The outcomes of ABI are unpredictable when compared to CI. The variability in outcomes could be attributed to many factors such as age at implantation, type of anomaly, placement of electrode, number of auditory electrodes and non-auditory electrodes, rehabilitation techniques, sound coding strategy. (Colletti 2007) Gradual improvement in awareness of environmental sound, utterances of words and sentences was observed with increase in implant usage. Speech recognition score was observed between Colletti, Carner, Veronese and Liliana Colletti (2005) tumor (T) and non-tumor (NT) condition who were implanted with ABI and the result revealed non-tumor patients had good performance when compared with tumor patients. Reduction in performance with ABI was seen in patients with neuropathy, cochlear malformations, and neurologic disorders (Colletti et al,

2005). Matthies et al., (2013) studied speech understanding in patients following implantation of ABI. The audiological performance was assessed using the Sound Effects Recognition Test, Monosyllable-Trochee-Polysyllable test and open-set sentence tests which revealed there were a significant improvement from initial fitting to 12 months follow up. Open-set sentence recognition tests improved from 5% to 37% after 12 months. Revealed Subjective outcomes were determined by using the self-reported questionnaire revealed that patients responded satisfied' to 'very satisfied' with their ABI. Madhav, Sampath Kumar, Vadivu, Natarajan and Kameswaran (2018) have studied 24 children who underwent ABI for a year. Outcomes were measured using 9 (CAP) categorical auditory perception and (SIR) speech intelligibility rating scale which revealed that at 6 months of implant age the average CAP and SIR scores were 2.07 and 1.37 and at 1 year the CAP scores improved to 3.42 and SIR to 2.33 respectively, which depicted gradual improvement in audiological and verbal outcomes.

The aim of the study is to profile the long-term outcomes in children with ABI with the minimum implant age of 3 years and above. It comprises of profiling the progress of the children in

auditory and speech performances at various time series of implant ages and to document the subsequent developmental trend in ABI implantees.

METHOD

Subjects included were 13 children with mean age range of 4.67 years and a user of Auditory Brainstem Implant. Participants with any behavioral, motor, or neurological deficits and syndromic conditions were excluded from the study. Informed consent was acquired from the parents of the children. The long-term subjective outcomes in various aspects such as auditory perception, auditory discrimination, auditory hearing performance, speech intelligibility and speech and language developmental skills were obtained in children with the implant age ranging from 3.6 to 10 years. The progress of a child's auditory and speech performances were obtained at different intervals from baseline (immediately after switch on), 6 months, 1 year, 1.6 years, 2 years, 3years and till the current implant age of each participant. The measures used for the prediction of outcomes are as follows,

Table 1. Subjective outcome measures

<i>Outcome measures</i>	<i>Skills assessed</i>
Aided audiometry (AA)	Hearing performance
SDS (Speech Discrimination Scores)	Auditory Discrimination
MAIS (Meaningful Auditory Integration Scale)	Auditory Discrimination
MUSS (Meaningful Use of Speech Scale)	Speech
CAP (Categories of Auditory Perception)	Auditory perception
GASP(Glendonald Auditory Screening Procedure)	Auditory comprehension
COT (Common Object Token Test)	Auditory comprehension
SIR (Speech Intelligibility Rating)	Speech
E-Reels (Extended Receptive and Expressive Language Scale)	Language

Descriptive statistics were carried out to profile the auditory, speech and language outcomes in ABI implantees at various implant ages. Inferential statistics were done to determine the significance across the intervals. Friedman test was carried out

to find the significant difference between mean rank scores of all the outcome measures across the time plots.

II. RESULTS

Result revealed that the above mentioned tests have been tabulated in table 1. There was an appreciable differences seen in mean scores for all the tests across different time series.

series of implant ages such as from baseline, 6 months, 1 year, 1.6 years, 2 years, 3years and The current implant age which revealed significant differences amongst all the tests and implant ages which is tabulated in the table 2 below

	MAIS		MUSS		CAP		SIR		COT		GASP		AA	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Baseline	2.53	2.75	4.61	3.27	1.00	.57	1.07	.27	0.00	0.00	0.00	0.00	79.73	7.81
6 months	12.53	6.46	9.07	5.13	2.69	1.37	1.69	1.03	0.46	1.66	0.07	0.27	61.14	14.61
1 year	21.84	8.47	15.00	7.33	4.07	1.18	2.30	0.85	7.38	11.57	0.30	0.85	52.43	11.63
1.6 years	24.76	7.97	17.61	7.46	4.23	1.09	2.53	0.77	13.15	11.05	0.38	1.12	49.48	9.23
2years	26.07	7.44	20.38	7.92	4.30	0.85	2.76	0.92	18.07	9.32	1.92	1.25	52.94	17.34
3 years	28.15	6.99	24.07	7.57	4.23	0.83	2.84	0.89	22.92	10.96	2.61	1.26	48.97	18.03
Current implant age	30.61	7.14	30.69	6.51	4.76	1.23	3.07	1.037	28.84	11.14	4.07	1.49	44.61	15.41

Inferential statistics include non-parametric friedman test to analyze the auditory and speech performance tests across time

Table 1. Mean and SD of Subjective outcomes across various Implant ages.

Table 2 Comparison of outcome measures across various Implant ages

Tests	Chi square	Significance value
MAIS	73.918	0.000*
MUSS	75.958	0.000*
CAP	64.317	0.000*
SIR	63.542	0.000*
COT	73.253	0.000*
GASP	72.122	0.000*
AA	38.680	0.000*

Friedman non-parametric test was carried out to determine the significance between mean rank and implant ages which revealed, MAIS scores for all the 13 participants from baseline till the current implant age were highly significant (p<0.05). Figure 1 depicts MAIS scores in various time plots. For S1, S2, S6, S8, S10, S12 the scores were gradually increasing over implant use. After 1.6 to 2 years of implant use the scores were plateaued. For S5, S7, S9, S11 there was a steady improvement in performance scores after 1.6 years of implant use the scores

was observed to be stagnant then the scores begun to rise after 3 years. For S3, S4, S13 even though they had less impressive outcome over performance scores there was a significant

improvement observed with increasing implant usage

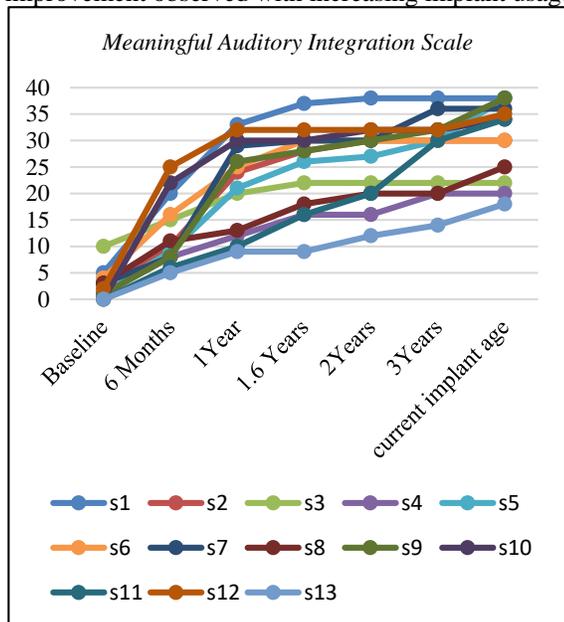


Figure 1. Meaningful Auditory Integration Scale scores.

The performance of MUSS indicates improvement in the speech performance with device use. Figure 2 indicates the MUSS scores across various time plots. For S3 and S5 there was a steady improvement in performance scores were observed beyond 2 years of implant use there was an abrupt increase in performance was noted. Similarly, for S8, S9, S10, S11, S12 was observed to have a rise from plateaued scores beyond 3 years of implant use. S1, S2, S6, S7 observed to have a gradual rise in outcomes. S4, S13 indicate a improvement over usage of the device but it is fairly appreciable.

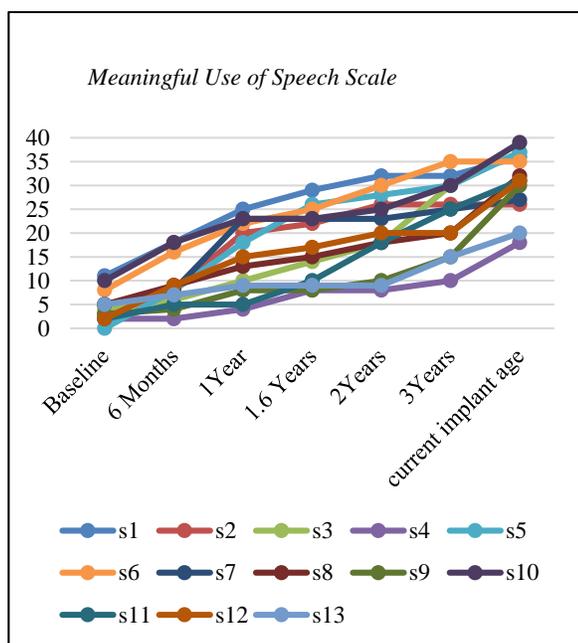


Figure 2. Meaningful Use of Speech Scale scores.

CAP was administered and a significant development was observed among all subjects. Figure 3 indicate CAP scores in

various time plots. For subjects S2, S3, S4, S6, S7, S8, S9, S11 the scores post 1 year of implantation was observed to be flat response or no evident improvement. For subjects S6 and S12, there was an abrupt rise from score 1 to score 5 (i.e. Awareness of environmental sounds to common phrases, no lip-reading) when compared to baseline. For subjects S1 and S10 there was an increase in scores till 6 and after 3years of implant use, there was an evident increase in performance. For S13 up to 1.6 years, the score was 1 (i.e. Awareness of environmental sounds) then at 4 years of implant age the score was observed to be 3 (i.e. Identification of environmental sounds)

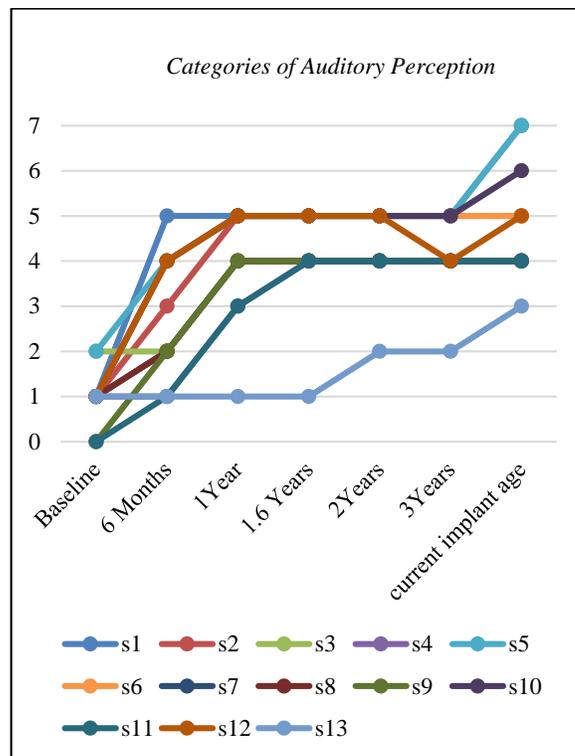


Figure 3. Categories of Auditory Perception scores.

The SIR scores were scattered among subjects. The overall speech intelligibility for all the subjects was limited with the score of 2 (i.e. Response to speech sounds) until one year of implant age beyond which there was a increase in speech performance. Figure 4 indicates SIR scores. For subjects S3, S7, S11, S13 less intelligibility scores were obtained when compared with other subjects.

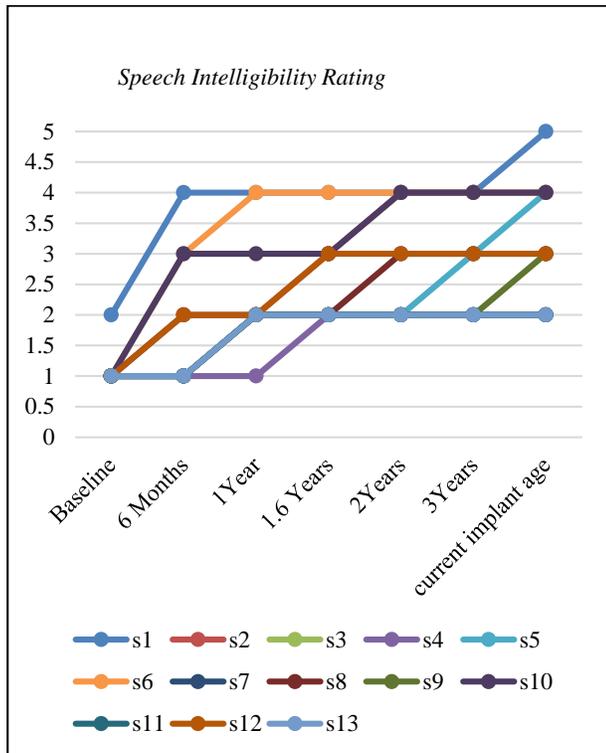


Figure 4. Speech Intelligibility Rating scores.

The overall performance of COT was observed to be limited in all the subjects. Subjects exhibit difficulty in identifying the sentences that is presented to them, which indicates limited listening abilities for understanding the sentences. On observation, increase in implant age indicates an evident increase in performance. For subjects S1, S5, S10, S6, S12 the COT scores exceeded 50% out of the total score.

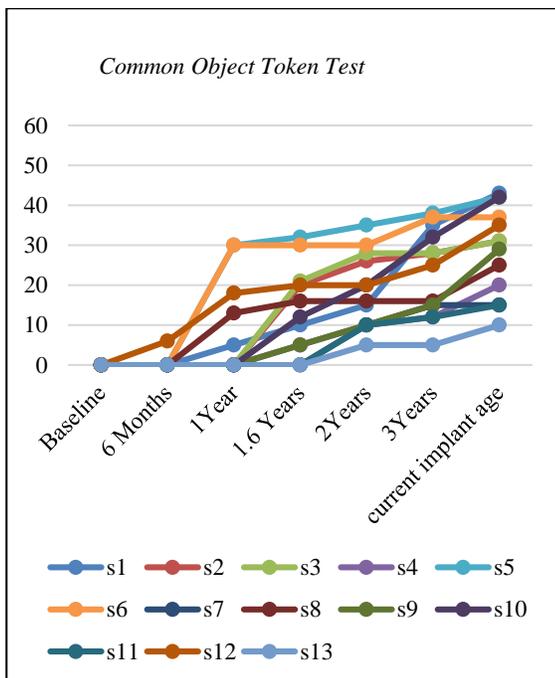


Figure 5. Common Object Token Test scores.

GASP is an open set standardized test that contains 10 questions. For subjects S2, S3, S4, S5, S6, S8, S9, S11 and S12 only after 2 years of implant use they were able to respond to the few questions. Beyond 2 years of implant age there was a slow and steady increase in performance were noticed. For S7 & S13 Less appreciable scores i.e. 2 out of 10 points were obtained and they were able to respond to the open set questions only after 2 years of implant use. Figure 6 indicates the GASP scores.

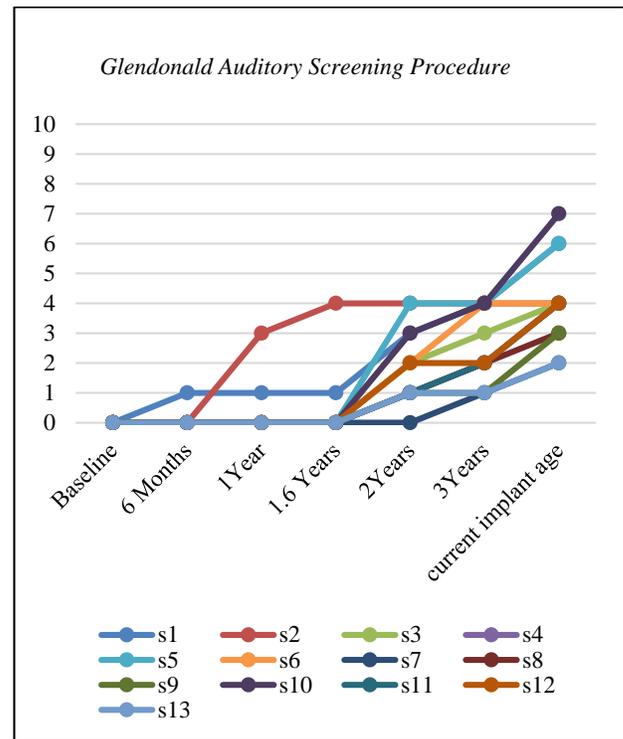


Figure 6. Glendonald Auditory Screening Procedure scores.

Aided audiometry measures the minimum threshold level at which the participants respond to the auditory stimuli. Overall auditory performances were observed to be highly significant for all the participants from baseline till the current implantation age of the children. There was a steady improvement in aided audiometry thresholds with increase in implant age. Figure 7 indicates the improvement in aided thresholds.

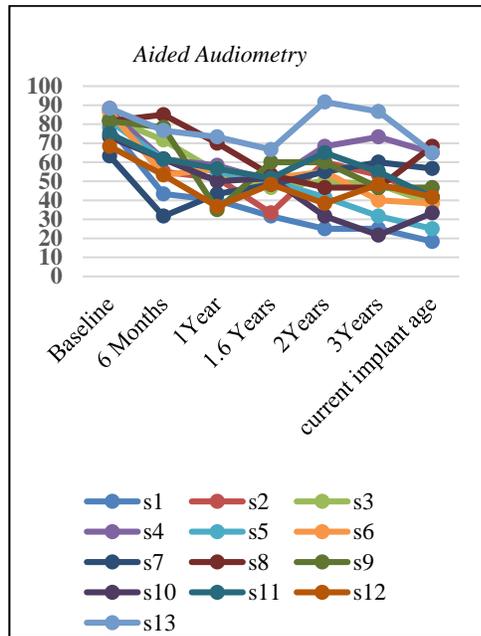


Figure 7. Aided audiometric thresholds

Speech discrimination scores (closed set) were assessed in all the individuals at current implant ages. subjects S1, S5, S6, S9 & S10 scored above 50 % in speech discrimination performance scores with increase in implant age varying from 3.6 to 10 years. Whereas the other subjects scores were noted to be below or equal to 50 %. The speech and language skills of all the participants revealed delayed receptive and expressive language skills. Even though there was a gradual improvement of speech and language skills with increase in implant age, the performance is same as the baseline age.

III. DISCUSSION

Holistically, there was a gradual improvement in auditory, speech and language skills on ABI use. S1, S5, S6, S9, S10 were observed to exhibit good performance scores in all the outcomes measures when compared with other subjects. On observation, there was a steady improvement beyond 1 year of implant age until the current implant age. A possible factor for the scattered performance across subjects would be attributed to implant usage.

The results obtained in the present study in accordance with literature by sennaroglu et al 2009, the auditory performance scores in which the MAIS and MUSS performance scores were observed to gradually increase as the implantation age increases. For a few subjects, the scores became plateaued between 1.6 to 3 years of implant age further there was an abrupt rise in performance scores (Yucel, Aslan, Ozkan&Sennaroglu, 2015). Auditory and listening skills were better when compared to oral communicative skills in all the subjects that is in consensus with a study done by Colletti et al, 2014 where most of the participants within 1-year of implant use showed awareness to environmental sounds (cap score 1) and within 3 years of activation, 26.4% were able to understand common phrases without assistant with lip reading (cap score 5) and among the 26.4 %, 13.2% of the children could use the telephone with a known speaker (cap score 7).

In comparison of CAP and SIR with aided thresholds, there was a significant improvement in scores for individuals with better aided threshold. Study done by Sennaroglu et al (2016) revealed a contraindicating result where, participants with better aided threshold exhibit low score in speech intelligibility rating (SIR) scale.

Yucel, Aslan, Ozkan & Sennaroglu (2015) stated that the speech intelligibility of the participants was observed to be poor until 1 year of implant age, which further improved on the increased duration of implant use which is analogous to the current findings on CAP and SIR test performance. One Assumption for their poor speech intelligibility could be reduced frequency resolution skills in ABI recipients.

Friedman (2016) did a study in patients using cochlear implant (CI) in which, GASP exhibit better speech perception only after 2 years of implant age. However, in ABI recipients, the temporal and spectral resolution skills were not determined when compared to CI. These findings may attribute to poor speech perception in ABI recipients.

Sennaroglu et al, (2016) stated that with an increase in ABI usage the aided thresholds, auditory and speech performance gets improved. Significantly when the hearing thresholds are better the CAP and SIR scores also improve which is correlated with the current study.

Teagle et al (2017) stated that children with ABI exhibited better receptive language skills and delayed expressive language skills and most of them exhibited delayed language skills, which could be due to slow development of auditory skills in children with ABI that precipitate limited changes in speech production.

IV. CONCLUSION

This work has highlighted that ABI is an effective approach for individuals with inner ear anomalies and cochlear nerve deficit to improve their communication and performance. It is evident that the overall auditory and speech performance increases with increase in implant age. However, few subjects in the present study was observed to have less improvement in their listening, auditory and oral communicative skills. This is attributed to several factors such as family support, socioeconomic status, cognitive skills of the child, other attention/behavioral issues, duration of deafness, course of habilitation, age of implantation, periodic mapping and follow up for audiological and speech & language evaluation, child's learning environment at school set up, educational placement of the child.

Limitation of this study includes, subject size was less. Objective outcomes measures can be administered in order to determine the correlation between subjective and objective outcomes. Detailed speech and language evaluation should be carried out to get more information regarding speech production and speech intelligibility. Multidisciplinary approach is required in pre and post implantation evaluation and follow up. Phonological development must be strengthened in order to improve speech production skills. Also children with ABI requires additional cues such as visual cues to aid them in effective communication.

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Correlation Between EABR and CAEP In Subjects With Auditory Brainstem Implant.

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DECLARATION

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ABSTRACT

The auditory brainstem implants are designed for use in adults with Neurofibromatosis II in order to restore the hearing and assist them in being able to hear all the sounds in the environment. Recently, the ABI has also been indicated for use in children with congenital inner ear malformations who would not benefit from hearing aids or cochlear implantation is not feasible due to anomalous cochlea. The ABI's have been recognized as an effective treatment option in children to reinstate the hearing. During the post-operative follow up procedures it is important to evaluate the integrity and functional outcome of the device. Out of all the objective measures used the eABR and CAEP were evaluated in this particular study to establish a relationship between the two measures in children with ABI. Prior to the eABR and CAEP measurements, IFT's were measured to check the electrode integrity. The electrodes were categorized into six groups based on the position. Single biphasic pulses were used to stimulate and the number of peaks observed and the dynamics in the peak amplitude were measured. It was observed that the mean amplitude of first peak, second peak and third peak was $0.54\mu\text{v}$, $0.21\mu\text{v}$ and $0.34\mu\text{v}$ respectively. Amplitude of first peak was observed to be larger than second and third peak. The amplitude of eABR in ABI is also dependent upon the etiology, placement of the electrode, type of stimuli used, noise level etc. The latencies of CAEP obtained in this study were prolonged compared to age matched children with normal hearing, yet the latency of P1 was smaller in children with longer duration of implant use compared to children with shorter duration of implant use. Presence of both eABR and CAEP complements each other to predict the auditory and non-auditory electrodes and the both eABR and CAEP warrants that the stimulated electrodes is on the cochlear nucleus, since the end of the auditory pathway is the primary auditory cortex.

KEYWORDS: Auditory brainstem implant, Cortical auditory evoked potential, Auditory brainstem implant.

INTRODUCTION

ABI is a prosthesis that is evolved out of cochlear implant technology that provides electrical stimulation to the Cochlear Nucleus bypassing the cochlea and the auditory nerve. The ABI is designed for patients with bilateral auditory nerve lesions that occur mainly in bilateral VS (Vestibular Schwannoma), a main characteristic of NF2 (Kalamardies et al., 2001; Sanna et al., 2012; Shannon et al., 1993). For significant number of patients, an ABI assists them to perceive ambient sounds, improves lip reading, gives sound awareness, and helps them in voice control. Factors that plays a major role in outcomes commonly spoken in the previous studies comprises size of the

tumor, duration of deafness, pre-implant radiosurgery,

Placement of the electrode, anatomy, severity of damage to the brainstem due removal of the tumor, and the number of activated channels on the implant. House and Hitselberger described the first case of a NF2-patient that received a single channel ball electrode on the VCN at the time of tumor removal in 1979 (Hitselberger et al., 1984; Edgerton et al., 1982).

Indications for ABI:

ABI can be helpful in children who have severe developmental anomalies and complete

ossification of cochlea. Inner ear anomalies comprises the main group. ABI is not required in all cochleovestibular malformations.

Sennaroglu et al (2009) divided the indications as definite and probable indications. Definite indicators include Michel aplasia (complete labyrinthine aplasia where cochlea, vestibule and

vestibular aqueduct is absent), Cochlear aplasia (complete absence of cochlea), Cochlear nerve aplasia (complete absence of cochlear nerve) whereas, probable indicators include hypoplastic cochlea, common cavity and incomplete partition type 1, incomplete partition type 11, hypoplastic nerve etc. If sufficient amount of neural tissue cannot be followed into the cochlear space, an ABI may be indicated.

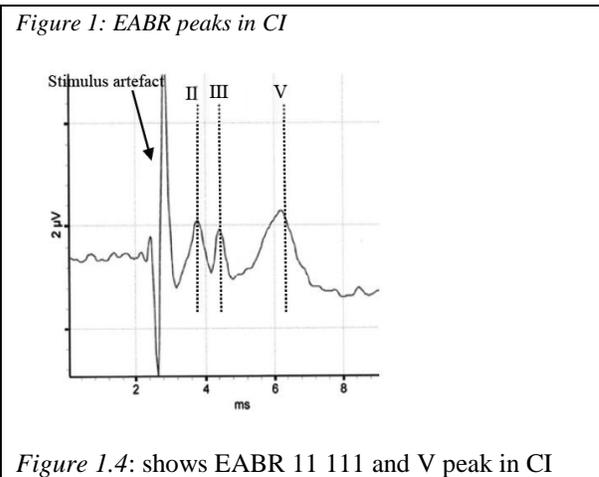
Use of objective measures in ABI

Auditory Brainstem Response:

The auditory brainstem response (ABR) measurement is an objective way to test the hearing system and is used for two main purposes; to estimate hearing thresholds and to determine retrocochlear pathologies (Arlinger, 2007). This technique can also be utilized as a tool to examine if the stimulation from a CI or an ABI reaches brainstem structures. In the first 10ms after a click stimuli is presented to the ear, a number of small waves can be recorded from the scalp. The principle behind recording ABR is that stimuli are presented to one or both ears and scalp electrodes detect changes in voltage from the skin. An sound amplifier is necessary because the amplitude of the obtained recorded signal is extremely low. A computer is used for digital signal processing, filtering to take out the unwanted frequencies, and for averaging data so that the ABR-response can be separated from noise.

Electric Evoked Auditory Brainstem Response

As an alternative to stimulating the ear with an acoustic stimulus, stimulation can be performed via the CI or ABI; Electrical Evoked Auditory Brainstem Responses (eABR). The obtained waveforms are significantly similar as those of acoustic ABR when activated via a CI; however, the initial first wave are not present and the latencies are significantly shorter.



When activating through CI, wave I is absent because the implant activation occurs in the cochlea where wave I is generated and this wave is commonly shaded by the stimulation artifact (Abbas & Brown, 1988; Cinar et al., 2011; Gordon et al., 2007; Firszt et al., 2002). When stimulating via an ABI, waves I and II are missing because stimulation occurs at the CN (Frohne et al., 2000; Herrmann et al., 2015; Nevison et al., 2002). Waveform shapes are also considerably different when stimulating via the ABI.

One explanation may be that the stimulation occurs at one of the possible generators of wave III, and because waves III, IV, and V are thought to have multiple generators; however, this presently remains unclear.

Figure 2 eABR peaks in ABI

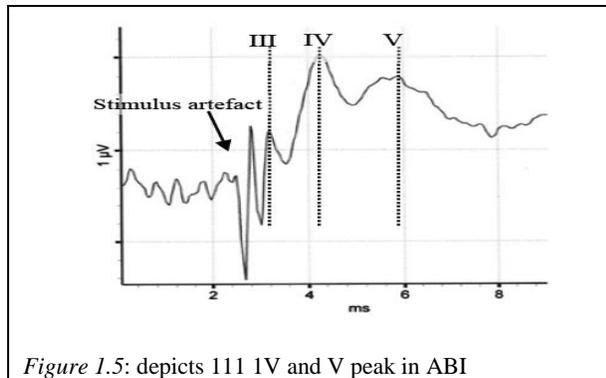


Figure 1.5: depicts 111 IV and V peak in ABI

Cortical auditory evoked potentials

Children born with congenital deafness or who are pre-lingually are faced with an auditory system that does not experience any auditory input. The central auditory system depends on this sensory input to mature and develop normally and if disrupted, normal developmental processes are altered. The maturation of the central auditory system is not fully complete until age 12 and in some cases even into the teenage years (Kral & Tillein, 2006). With implants, some aspects of the auditory cortex can be restored with electrical stimulation of the auditory nerve. Thus prosthetic devices can provide deaf children with new auditory inputs, instead of a system that would otherwise be deprived of auditory stimulation (Kral & Tillein, 2006).

The effectiveness of the implants on the maturing central auditory system can be determined by objective measures such as CAEP. CAEPs are a useful objective tool because they can measure the maturational processes for auditory cortical function, since the P1 latency varies as a function of chronological age. P1 latency reflects the accumulated sum of delays in synaptic propagation through the peripheral and central auditory pathway (Sharma et al. 2002). With these objective measurements, CAEPs can determine how the central auditory system is developing with electrical stimulation from the implants.

Cortical auditory evoked potentials (CAEPs) reflect the function of the auditory thalamo-cortical pathways and the auditory cortex, and so are a window to the 'auditory brain'. They are a valuable prognosticator for predicting long-term outcomes in both cochlear and brainstem implantees. By profiling the aided CAEPs in children with ABIs its efficacy

can be assessed and thereby helps in evaluating ABI outcomes.

The objective measures like eABR plays a cardinal role in predicting the proper placement of electrodes. The absence of an eABR was not associated with absence of auditory sensation elicited by electrodes in the section of the array stimulated. Therefore the presence of an eABR was considered a good sign, but the absence of an eABR was not of any assistance in identifying non-auditory electrodes (O' Driscoll et al., 2011). Thus there is a need for CAEP measure to validate whether the electrical signals are reaching in the higher auditory centers.

NEED:

To establish a relationship between Electrically Evoked Auditory Brainstem Response and Aided Cortical Auditory Evoked Potentials in subjects with Auditory Brainstem Implant.

AIM OF THE STUDY:

The aim of the study was to correlate electrically evoked auditory brainstem responses (eABR) and cortical auditory evoked potentials (CAEP) in Auditory Brainstem Implants.

Intra operative eABR measurements

Colleti et al (2000) studied the use of e ABR in intra operative positioning of the ABI electrode array and in making decision regarding a CI or an ABI in patients with Acoustic Neuroma in the aim of hearing restoration following a surgical removal of Acoustic Neuroma. The results revealed that the intra operative e ABRs were a good predictor for positioning for ABI electrode array. The responses obtained were reliable after repositioning of the device.

O'Driscoll et al 2011, have described the Electrically Evoked Auditory Brainstem responses by stimulating the Auditory Implants in children with cochlear nerve Aplasia or Hypoplasia. The number of peaks in the eABR showed a significant correlation with the number of auditory electrode at initial device activation. It was also concluded that the trend for fewer peaks in the eABR with one peak were more likely to arise from stimulation of auditory tissue in the Cochlear Nucleus. It was also concluded that the presence of eABR was a good predictor of auditory responses. The absence of the eABR was poor at predicting sites with no auditory responses.

Post-operative eABR measurements

Maria Valeria et.al, (2012) reported outcomes in 3 out of 4 children with cochlear and 8th nerve aplasia that free field thresholds with warble tones varied from very soft auditory sensation of 70dBHL at 250 Hz to a pure tone average of 45dBHL.

Sennaroglu et al 2009 described the results of 11 children in the age range from 2.5 to 5.0 years with inner ear malformations including severe stenosis of the cochlear aperture and aplasia of the cochlear nerve underwent ABI. Auditory performance of 6 children revealed that they gained basic audiologic functions and were able to recognize and discriminate sounds and could identify environmental sounds also by three months after ABI. They typically improved in their closed-set speech perception scores performance. It was concluded that, ABI was a better option for hearing restoration in children with Inner ear malformations that are contraindications to Cochlear Implant surgery. Patients with additional malformations slowed progress, but ABI also helps them in their everyday life.

Maturation of cortical potentials

The central auditory system depends on this sensory input to mature and develop normally, and if disrupted, normal developmental processes are altered. The maturation of the central auditory system is not fully complete until age 12 and in some cases even into the teenage years (Kral & Tillein, 2006).

With the implants, some aspects of the auditory cortex can be restored with electrical stimulation of the auditory nerve. The prosthetic devices can provide deaf children with new auditory inputs, instead of a system that would otherwise be deprived of auditory stimulation (Kral & Tillein, 2006). To determine the effectiveness of the implant on the maturing central auditory system, objective measures such as CAEPs can be used. CAEPs are a useful objective tool because they can measure the maturational processes for auditory cortical function, since the P1 latency varies as a function of chronological age (Sharma et al., 2002).

Kameshwaran M et.al (2013) reported that CAEP can be successfully recorded in ABI and CAEP profiling can be an objective method of analyzing the optimal placement and function of the ABI electrodes on the brainstem. Thus CAEP is an efficient adjunct to electrically evoked auditory brainstem (eABR) for testing ABIs. When stimulated via the ABI, CAEP may reflect re-organization of higher auditory centers and hence a good prognosticator for long- term assessment of ABI performance.

METHODOLOGY

Participants included eleven children with auditory brainstem implants. The demographic data of the subjects are listed in the Table 1.

Table 1

SUBJECT	GENDER	AGE	IMPLANT AGE	SIDE	RADIOLOGY
S1	Male	2years 10months	11 months	Right	Cystic cochlear-vestibular anomaly. Stenotic internal auditory canals with bilateral cochlear nerves not demonstrated.
S2	Female	13years 6months	3years 9months	Right	Bilateral labyrinthine aplasia (Michel Aplasia). Bilateral absent 8 th nerve

S3	Male	4years 2months	1year 10months	Right	8 th nerve is not visualized bilaterally. Bilateral internal auditory canal are of reduced caliber. The bony canal for the cochlear nerve is also of very small caliber.
S4	Male	11years 3months	7years	Right	Hypoplastic right eighth nerve-vestibular component. Left cochlear nerve is absent/ grossly hypoplastic.
S5	Female	7 years	2years 2months	Right	Complete absence of cochlea, semicircular canal, utricle and saccule s/o Bilateral Michel's aplasia.
S6	Female	6years 2months	1year 4months	Right	Hypoplastic vestibule with malformed/deformed bilateral posterior semicircular canals. Bilateral IAC stenosis with absent 7 th and 8 th nerve complexes.
S7	Female	5years 5months	1year 9months	Right	Cochlear nerve and vestibular nerve are non visualized, hypoplastic on either sides. Bilateral internal auditory canal are stenosed.
S8	Male	6years 8months	2years	Right	Malformed cochlea on both sides with severely dysplastic cochlear nerve on the right side and absent cochlear nerve on the left.
S9	Female	4years 11months	1year 5months	Right	Bilateral Michel's aplasia and absent right cochlear, superior vestibular and left vestibulocochlear nerves.
S10	Male	3years 3months	1year 3months	Right	Cochlear nerve and vesibular nerve are non visualized, hypoplastic on either sides.
S11	Male	6years 3months	1year 4months	Right	Bilateral internal auditory canal stenosis with absent 7 th and 8 th nerve complexes.

Instrumental Set-up for eABR

eABR recordings was performed using GSI Audera EP system connected to the laptop with the Audera software version 2.7.5 installed. The EP system was connected to the pre amplifier using a connecting cable. Electrodes were connected to the pre amplifier. Positive electrode was placed on the vertex (Cz), Ground electrode on the upper forehead (Fz) and Negative on the contralateral mastoid (C7). A single channel recording setup was established. A trigger cable was connected between the EP system and the diagnostic interface box (dIB II) used for stimulation. The dIB II was connected to a laptop with Maestro software version 4.1.2 to control and manipulate the stimulus parameters. The stimulus was delivered to the implant via a cable with a transmitting telecoil, connected to dIB II. The telecoil was placed over the receiver stimulator of the implant during stimulation.

Impedance Field Telemetry (IFT):

Before recording eABR and measuring psychophysical levels, IFT was performed to check the integrity of the electrode array. A telemetry coil was connected to the dIB II which was placed over

the receiver stimulator to deliver the stimulus to the internal implant. The IFT enables measurement of voltages at intra cochlear electrodes of the Med- EL implant during stimulation. The measured results show the impedance of individual intra electrodes, ground path impedance, integrity and coupling between the implant and dIB coil are indicated.

Recording

Single biphasic pulses were used to stimulate. The onset of the stimulus coincided with the onset of the trigger pulse to the evoked potential system. The amplitude of stimulation was expressed in current unit (cu) that can range from 0-1200cu. These units as defined by the manufacturer relate to the amount of current delivered. 1cu is equivalent to 1µv (Med EL limited). Following IFT, an eABR trial was recorded at 0cu for all the electrodes and was considered as a baseline recording. This recording was used to understand the dynamics of the stimulus artifact. The initial level of stimulation was started at 100cu. The stimulus level was manipulated from 100 – 500cu depending on the appearance or absence of responses.

Table 2 eABR stimulus and Recording Parameters

S.NO	STIMULUS	RECORDING
1.	Electrical stimulus- Biphasic pulses through the implant	Responses recorded using surface electrodes.
2.	Pulse duration 30-65µs	Time window: 10ms
3.	Polarity: negative initial phase	Filter: 30Hz-3000Hz
4	Rate : 34pps	Gain: 100000
5.	Number of sweeps:1500	Artifact rejection level: 50µv

G1b (medial inferior), G2a (lateral superior), G2b (lateral inferior).

Number of peaks observed and the dynamics in the amplitude of the peaks were measured and calculated during each interval of recording. Electrodes in which observable eABR responses was obtained were considered as “Predicted Auditory Electrodes”, and the other electrodes in which no observable eABR responses were considered “Predicted Non Auditory Electrode”. Non auditory sensations caused by the stimulation were carefully observed.

ABI Electrode Category

ABI electrode is with 12 active electrodes and one reference electrode. The electrodes from one to six forms the medial electrodes and 7-12 form the lateral electrode parts of the cochlear nucleus complex (CNC). The electrode complex was categorized into six groups G1 (medial electrodes), G2 (lateral electrodes), G3(all electrodes), G1a(medial superior),

CAEP Measurement

A nal Hear lab system (Frye electronics) was used for the procedure. The subject was seated comfortably on a chair with a loudspeaker approximately at a distance of 1meter from his/her head (in the two hearing centers respectively) with the loudspeaker placed at 0dB azimuth. Silent cartoons were played to keep the client on position. The state of the child was often monitored by the audiologist as the test progressed to ensure that the electrodes are in place and also to check for the alertness of the child. Cotton applicator and electrode gel was used to prepare the electrode sites. Electrode impedance was checked. 2 kohm impedance was maintained between the active and the ground and also between the reference and the ground. The electro encephalography (EEG) activity was monitored throughout the recording.

The Hear lab system uses an automatic statistical detection procedure which does not necessitate a subjective response interpretation from the operator (Carter, Golding, Dillon & Seymour 2010). This system generated significance level (p-level) was used to determine whether or not a response was present and to determine the end of the test run. CAEP was judged to be present if the p-value reached the level of $p < 0.05$. One hundred accepted epochs were elected as a higher number of epochs that makes data collection with this age group clinically not feasible in a restricted measurement time. Speech stimuli (/m/, /g/, /t/) were presented and recorded at 75 and 65dB SPL. Cortical recognition of these speech stimuli does not essentially signify detection of frequency cues, but rather (mainly) a detection of transient or onset (Burkard, Eggermont and Don 2007).

RESULTS AND DISCUSSION:

eABR was recorded in all the eleven subjects by grouping the electrodes as G1, G2 and G3. G1- Medial Electrodes (EL1 to EL6), G2 Lateral Electrodes (EL 7 to EL12) and G3- All Electrodes (EL1 to EL12). In all the three groups CAEP waveforms was also recorded. A clear biphasic stimulus artifact was consistently observed within the first 0.72msec from the start of recording. In the Martin O' Driscoll (2011) study also reported the presence of a biphasic stimulus artifact at 0.76msec from the start of the recording.

Morphology and Latency of Electrically Evoked Auditory Brainstem Response

eABR findings in G1 (Medial Electrodes):

Medial electrodes from EL1 to EL 6 were stimulated using bi-phasic electrical stimuli. The waveform morphology can be expressed in terms of number of peaks present. It varied between one peak, two peaks and three peaks ie; P1, P2 and P3 respectively. Among the eleven subjects first peak (P1) could be obtained in four subjects (S2, S3, S4, S5). First (P1), second peak (P2) and third (P3) peak could be recorded only in one subject (S3). Peaks could not be recorded in the other six subjects. In one subject (S1) eABR could not be recorded since the

electrodes were disabled due to presence of non-auditory sensation observed during programming.

The average latency of the first peak was recorded at 1.38ms, second and third peaks at 1.71ms and 3.37ms respectively. Inter peak latencies were found to be variable compared to conventional acoustic auditory brainstem responses, no inferences could be made since all the three peaks were obtained in a single subject (S3). It was observed that the mean amplitude of first peak, second peak and third peak was 0.54 μ v, 0.21 μ v and 0.34 μ v respectively.

eABR findings in G2 (Lateral Electrodes):

Lateral electrodes from EL7 to EL 12 were stimulated using bi-phasic electrical stimuli. First peak (P1) could be recorded in five subjects, first (P3) and second peak (P3) could be obtained in one subject. In this group third peak (P3) was not obtained and no peaks could be recorded in the other six among the total eleven subjects. The average latency of first peak was obtained at 1.1ms and second peak at 2.5ms. The mean amplitude of first peak was 0.28 μ v and second peak was 0.23 μ v.

Colletti (2001) described eABR morphology for three of the children as being either two or three positive peaks with latencies between 1.0ms and 3.0msecs. The three peaks were equated to wave III, IV and V of an acoustically evoked ABR and their origins attributed to the cochlear nucleus, superior olive and lateral lemniscus, respectively. When comparing the children's response to those from adults, P1 is analogous to the Acoustic ABR wave III. P2 is likely to be equivalent to acoustic ABR wave IV and P3 would equate to acoustic ABR wave V (Frohne et al. 2000).

eABR findings in G3 (All Electrodes)

All the electrodes from EL1 to EL 12 were stimulated using bi-phasic electrical stimuli. First peak could be recorded in five subjects, second peak in three subjects and first second and third peak in only one subject. The average latency of first peak was obtained at 1.4ms, second peak at 2.26ms and third peak at 3.9ms. The mean amplitude of first peak was 0.80 μ v, second peak was 0.75 μ v and third peak was 3.6 μ v.

Martin O,Driscoll (2009) studied the morphology of eABR in subjects with Auditory Brainstem Implant, he also recorded three different morphology based on the emergence of the peaks. He noticed the latency of P1 at 1.53ms, latency of P2 at 2.34 and latency of P3 to be around 3.65ms. The latency obtained in our study is more or less similar to the latencies obtained by O,Driscoll et al 1996. However in the present study electrodes EL1 to EL6 were stimulated simultaneously, whereas O’Driscoll (1996) stimulated electrodes sequentially. The amplitude of each waveform were measured as the fall from the peak to the following trough; if the peak was observed to be overriding a later peak then

Figure 3: Three peak wave morphology in eABR

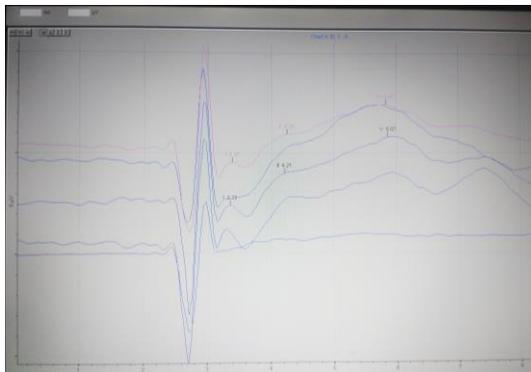


Figure 3: shows the three peaks (P1, P2 & P3) recorded in eABR while stimulating the medial electrodes in S3.

the amplitude was measured as the rise from the preceding trough to the peak (Martin O Driscoll 2011). It was observed that the mean amplitude of first peak, second peak and third peak was 0.54µv, 0.21 µv and 0.34 µv respectively. Amplitude of first peak was observed to be larger than second and third peak. Martin O’ Driscoll (2011) studied the amplitude of eABR peaks in subjects with Auditory Brain Stem Implant and the average amplitude was recorded as for first peak ranging 0.60 µv to 0.90µv, second peak 1.2 µv to 1.88 µv and third peak 2.04 µv to 3.00 µv. The amplitude obtained in this study was comparatively less from the Martin O’ Driscoll (2011) study. However the amplitude of eABR in ABI is also dependent upon the etiology, placement of the electrode, type of stimuli used, noise level etc.

eABR amplitude and latency across the groups

The amplitude of medial electrodes was higher compared to the lateral electrodes. This could be due

to the positioning of electrode during the surgery, it is hypothesized that when the electrodes stimulate the cochlear nucleus it will elicit good action potentials, compared to electrodes that do not or partially stimulating the nucleus. The evidences from O’Driscoll (2009), Senaragolu (2011) and Colletti (2012) also confirms the hypothesis. In this study the electrodes on the lateral part of the electrode pad might have had less contact compared to the medial electrodes. The ongoing study at our center on the case by case comparison of the surgical, audiological and outcome may shed some light on strengthening the hypothesis.

Figure 4: Amplitude and latency

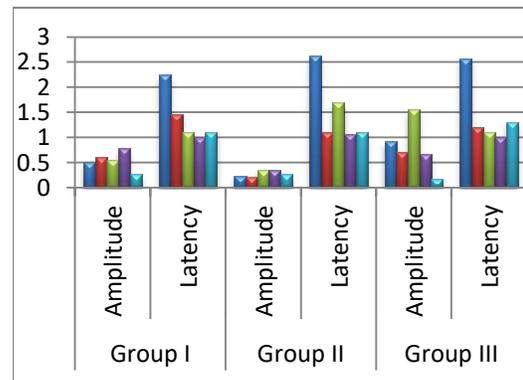


Figure 5.2 shows the amplitude and latency of P1 across G1 G2 and G3 in five subjects.

There was no significant latency difference across the three group oelectrodes. Martin O’ Driscoll (2009) has explained the amplitude growth function of eABR, that the amplitude of eABR increased when the stimulus were increased. He also explained that the noise level during the procedure could also contaminate the responses.

Aided Cortical Evoked Potentials

Aided Cortical Auditory Evoked Potential by stimulating G1 (Medial Electrodes):

P1 could be obtained at both 65dB SPL and 75dB SPL for /t/ stimulus. P1 was present for seven subjects when presented at 75dB SPL. P1 was present for both 65dB SPL and 75dB SPL for five subjects. The average latency of P1 for 75dBHL was 159.5ms

with average amplitude of $3.95\mu\text{v}$. The significant value was <0.005 . At 65dBHL P1 was recorded at 171.6ms with the average amplitude of $3.25\mu\text{v}$ with a significance value <0.005 . In one subject (S1) CAEP could not be recorded since the electrodes were disabled due to presence of non-auditory sensation observed during programming. Mean implant age was 2.3years “time in sound” and mean chronological was 5years 11months. Kameswaran M et.al (2013) studied aided CAEP in Auditory Brainstem Implants and recorded P1 morphology for three subjects recorded at 100-150ms. The results obtained were comparable with the present study.

Aided Cortical Auditory Evoked Potential by stimulating G2 (Lateral electrodes):

P1 could be obtained at both 65dB SPL and 75dB SPL for /t/ stimulus. P1 was present for two subjects (S2 and S5) when presented at 75dB SPL with an average latency of 216ms. And the average amplitude was recorded around $6.1\mu\text{v}$. The significance value of was <0.005 . P1 was present for both 65dB SPL and 75dB SPL for only one subject. The average latency of P1 for 65dB HL was recorded at 255ms with an average amplitude of $4.6\mu\text{v}$ and the significance value was <0.005 . Peaks could not be obtained in the other nine subjects.

The latencies obtained in this study were prolonged compared to age matched children with normal hearing, yet the latency of P1 was smaller in children with longer duration of implant use compared to children with shorter duration of implant use. Sharma et al. (2002) and Ponton et al. (1996) examined P1 latencies of cortical auditory evoked potentials in children with Cochlear Implant. Both the studies revealed the latency of P1 was prolonged in children with cochlear implant compared to age matched children with normal hearing. However the latency of P1 was smaller in children with longer duration of implant use compared to children with shorter duration of implant use. These findings are in consonance with our findings. Sharma et al 2002 also found that the latency of P1 decreased rapidly within the first 6 months after the activation of the external sound processor, except for children implanted at very late age.

Aided Cortical Auditory Evoked Potential by stimulating G3 (All Electrodes)

P1 could be recorded at 75dB SPL and 65dB HL for /t/ stimulus for seven subjects among the total eleven subjects (S1, S2, S3, S4, S5, S7 and S8). Peaks could not be obtained for the other four

subjects. The mean amplitude of P1 for 75dB HL was $2.8\mu\text{v}$ and mean latency was 165ms with a P value <0.005 . Among this seven subjects P1 for both 75dB HL and 65dB HL could be obtained only in five subjects. The mean amplitude of P1 for 65dB HL was $2.3\mu\text{v}$ and mean latency was 183ms with a P value <0.005 .

CAEP latencies across the subjects in G3:

Figure 5: CAEP latencies

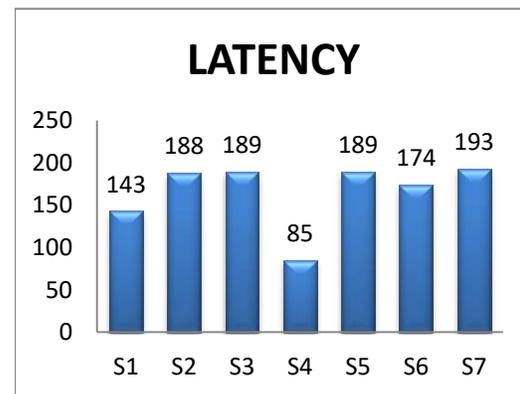


Figure 6: depicts the latencies of CAEP across the seven subjects

Aided CAEP P1 waveform could be obtained in seven subjects among the eleven subjects. The latencies of the peaks ranged from 85-200 ms. In one subject (S4) the latency was observed to be similar to that in normal hearing children ie; 85ms. The implant age of this particular subject is the highest among the eleven subjects ie; seven years. Kameswaran M et.al (2013) studied aided CAEP in Auditory Brainstem Implants and recorded P1 morphology for three subjects recorded at 100-150ms. In his study he also found that the latency of aided CAEP reduced with respect to the duration of the implant use this is in consonance with our findings.

CAEP amplitude across the subjects in G3

The amplitude of the aided cortical potentials in the seven among the eleven subjects was between $0.75-6\mu\text{v}$. The highest amplitude was obtained in S4 who has the highest implant age (7yrs) among the subjects.

In one subject the eABR and CAEP were measured by stimulating the electrodes more categorically, in the Medial group of electrodes the EL2 and EL5 were considered as superior and EL3 and EL6 were considered as inferior with respect to the positioning. And in the Lateral group of electrodes the EL7 and EL10 were considered as superior and EL 8 and EL11 were considered as inferior.

Two peaks (P1 & P2) could be recorded in medial superior electrodes (EL 2 & 5), the amplitude of first peak (P1) was 0.27µv and the latency was 1.21ms and second peak (P2) was recorded at the latency of 2.37ms with an amplitude of 0.16µv. No peaks could be recorded in medial inferior electrodes (EL 3 & 6) even after increasing the stimulation level. Single peak (P1) was recorded in lateral superior electrodes (EL 7 & 10) with an amplitude of

Aided CAEP for both inferior and superior electrodes in the medial group. Latency of P1 obtained in the lateral superior electrodes (EL 7 & 10) was 165ms with the amplitude of 4.04 µv and the significance value p was <0.005. In the lateral inferior electrodes (EL 8 & 11) P1 was recorded at the latency of 181ms with the amplitude of 1.92µv and the significance value was <0.005. Though no statistical correlation or significance could be made for the single subject the data obtained shows that relationship between the morphology of eABR and CAEP was good. In this subject the presence of eABR also confirms the presence of CAEP. There was no study in the literature that compared the correlation of the morphology of eABR and Aided CAEP in ABI.

RELATIONSHIP BETWEEN eABR AND CAEP MEDIAL ELECTRODES (EL 1 to EL6)

eABR was present in four subjects among the eleven subjects who participated in the study. In all the four subjects were eABR was elicited also yielded good CAEP. Only one subject had the lateral electrodes switched-on. All the medial electrodes were switched-off due the presence of non-auditory sensation.

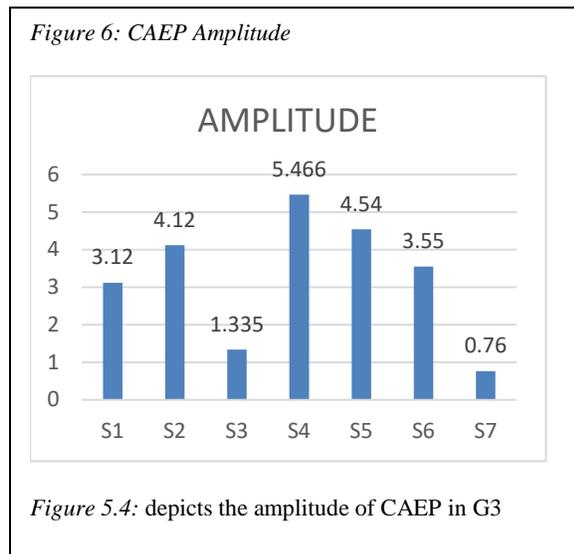
LATERAL ELECTRODES (EL to EL12)

eABR was present in four subjects among the eleven subjects. Among the four subjects in whom eABR was recorded, two subjects also showed good CAEP. In other two subjects the CAEP was absent.

ALL ELECTRODES (ALL ELECTRODES)

eABR could be recorded in five subjects among the eleven. And CAEP was recorded in seven subjects among the total eleven subjects who participated in the study. Out of seven subjects were CAEP was recorded, eABR could not be recorded on two subjects.

eABR and CAEP could be recorded in most of the subjects, in subjects were CAEP and eABR could not be recorded have to be examined in detail with respect to the etiology, surgical and behavioral responses. eABR morphology, latency and amplitude were in consonance with O,Driscoll (2011) study . Presence of CAEP and absence of eABR could also be explained due to the fact that the auditory brainstem response is a test of neural synchrony. To record ABR either elicited electrically or acoustically the neural firing has to be in synchrony with the stimulus onset, failing which the action potentials could not be recorded. Unlike eABR, recording Late Latency Response especially CAEP does not require synchronous firing. For the same purpose, CAEP is also included in the test battery for differential



0.82µv at the latency of 1.04ms. In the lateral inferior electrodes (EL 8 & 11) single peak (P1) was recorded with an amplitude of 0.33µv at the latency of 1.00ms.

P1 of the Cortical Auditory Evoked Potentials could be recorded in all the sub categories of electrodes. In the medial inferior electrodes (EL 3 & 6) P1 was recorded at the latency of 173ms with an amplitude of 1.5µv and the significance value was <0.005. Though no eABR peaks were recorded in the medial inferior electrodes, P1 of aided CAEP could be recorded. The absence of eABR and the presence of CAEP could be due to insufficient stimulation.

In the medial superior electrodes (EL 2 & 5) P1 was obtained at an amplitude of 1.78µv with the latency of 166ms and the significance value was <0.005. There is no difference in amplitude of P1 in

diagnosis of Auditory Neuropathy Spectrum Disorder.

eABR poses technical challenges while recording by stimulating the brainstem. The responses amplitude of eABR is higher than the acoustical ABR, so the device that is used to measure eABR should have a high saturation pre amplifier, but still sometimes it is very difficult to pick the appropriate peaks due to high noise levels. Presence of eABR confirms that the electrode is on the cochlear nucleus, but absence of eABR do not warrant that the electrode stimulated is not on the cochlear nucleus O.Driscoll (2009).

However it is important to note that presence of both eABR and CAEP warrants that the stimulated electrodes is on the cochlear nucleus, since the end of the auditory pathway is the primary auditory cortex.

CONCLUSION:

Auditory Brainstem Implant by passes cochlea and stimulate the cochlear nucleus directly, thereby restoring the auditory sensation. eABR plays a cardinal role in predicting the electrode positioning intra operatively and postoperative programing. It is the most frequently used electrophysiological test in children and adult with Auditory Brainstem Implants. Intra-operative eABR objectively identifies the correct location of the electrodes with respect to the cochlear nucleus and also confirms optimal implant function. eABR thresholds can be used as a guide to program the mapping levels in the ABI at the time of switch on. After switch-on, eABR thresholds can be used as a guide to program the mapping levels in the ABI. eABR is a time consuming procedure. Factors during testing like muscle artifacts, EEG interference, and electrical interface mismatch may affect eABR wave- forms, resulting in inconclusive recordings. More over the morphology of brainstem stimulated eABR is not well defined, since there is a high variability within and across the subjects and electrodes tested. Etiology and tissue damage during the surgery can also be an important factor affecting eABR.

The study includes another electrophysiological measure to complement the eABR findings and to predict the auditory and non-auditory electrodes. Cortical Auditory Evoked Potentials were employed to measure the responses by stimulating the electrodes in the brainstem.

In this study all the subjects were implanted with MedEl Auditory Brainstem Implant, which had 12 active surface electrodes placed on the pad called the electrode pad. The electrodes were grouped based on the location in the Brainstem. Electrode one to electrode six were grouped as medial electrodes,

electrodes from seven to twelve were grouped as lateral electrodes. Both eABR and CAEP were performed by stimulating both the groups independently and also by stimulating all the electrodes.

Morphology of eABR was described based on the number of peaks. Three peaks were recorded in this study, but all the three peaks were not present for all the subjects. Most of the subjects had single peak (P1) eABR, two subjects had two peaks (P2) and one subject had all the three peaks (P3). Average latency of peaks was 1.38ms, 1.71ms and 3.37ms for P1, P2 and P3 respectively. CAEP were recorded in most of the subjects in all the groups. In general the medial electrodes yielded more eABR and CAEP compared to the lateral electrodes. CAEP's were recorded at both 65dB SPL and 75dB SPL. Amplitude of P1 of CAEP was larger at 75dB SPL compared to 65dB SPL stimulation level.

In few subjects both eABR and CAEP were not recorded. It is evident from this study that eABR and CAEP were recorded reliably from both the group of electrodes. Presence of both eABR and CAEP complements each other to predict the auditory and non-auditory electrodes.

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Design And Implementation Of Digital Library Management System. A Case Study Of The Niger Delta University, Bayelsa State

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Abstract- Libraries have been a fundamental fragment of educational and information sector of any university. The success of any library largely depends on proper management. Several libraries, including the Niger Delta University library, have suffered catastrophe as a consequence of insufficient administration and weaknesses in handling delicate information as regards members of the library, difficulty in storage space restraint, searching for, and finding desired books, availability of library and library materials at all times etc. It is therefore the purpose of this study to design and develop a digital library system (DLS) for the Niger Delta University, which digitalizes and answers difficulties confronted by the traditional library and support in positioning the library to meet its incessant increasing demands. The traditional system used by the University was analyzed using a standard procedure recognized worldwide for such purposes, known as “Structured System Analysis and Design Methodology” (SSADM). PHP Scripting Language and other software development tools such as HTML and CSS were used in building this system.

Index Terms- Digital Library, FPE Library, Library, Library Management System, Digital Library System, Electronic Library, Digital Repository, Paperless library, electronic library, virtual library, libraries without boundaries

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I. INTRODUCTION

In this study, electronic library is the use of digital technologies to acquire, store, reserve and make available access to information and material originally published in a digital form or digitized from existing print audio-visual or other forms. Consequently, it has necessitated a scientific technique to information and for revelation of its most characteristic properties which has led to two primary vicissitudes in explanation of the perception of information. It was initially expanded to embrace information exchange not only between machine and machine but also between man and man. The users of traditional library system have too much difficulties in finding records, there are also the

problems of limited space, funding of library buildings, round the clock availability, etc.

The existing system used by the Niger Delta University is the traditional manual library system. The traditional system entails documentation of borrowed books, return date, lease date, library users’ details and other documentations on paper files. Books are physically indexed and library users must be physically present in the library to access contents of the library system.

The Individuals information needs have long been studied by researchers in information technology, education, and marketing. Individuals, scholars, educationists, businessmen, etc, brings different types of information needs to libraries. Researchers from Information technology has identified that there are different levels of information needs, which includes specified conscious, visceral, formalized, and compromised levels. That entities differ on a congregation of mental, physical, and emotional physiognomies are defining condition of humanity. Psychology is much enthusiastic to identifying the indispensable dimensions of human behaviour.

As a solution to the problems faced by traditional library, this research work proposes the design, implementation and use of a Digital Library System (DLS), which will focus on collection of digital objects that will encompassing visual material, text, audio/video material, and store them in electronic media formats, along with techniques for the organization and retrieval the files and media confined in the library collection and making them available online, in a searchable form

II. JUSTIFICATION OF THE PROPOSED SYSTEM

The proposed system will play a vital role in enhancing the overall library process in Niger Delta University. The proposed system has the following advantages.

- Eliminate data redundancy and improve data integrity
- They are much cheaper than buying and maintaining a library
- They are more portable, because you can download a huge number of cases to a laptop or memory stick and carry them with you, rather than having to print reams of paper

- Centralized database model to manage student information
- By using cut and paste techniques they cut down on the amount of time required to prepare briefs and motions.

III. ADVANTAGE OF THE PROPOSED SYSTEM

The system would support round the clock availability, that is, the library system can be accessed at any time, 24 hours a day and 365 days of the year. Other advantages of the system include:

- Structured approach: The system would provide access to much richer content in a more structured manner i.e. one can easily move from a catalog to a particular book then to a particular chapter.
- Information retrieval: A user would be able to use any information (book title, author, ISBN, department, faculty or level) about a book to search for and retrieve the book.
- No physical boundaries: A user can access the library from anywhere, as long as internet connection is available. A user needs not to go to the library physically.
- Multiple access: The same resources can be accessed and or use at the same time by a number of users at same or different locations.

IV. BACKGROUND OF THE STUDY

From the point of view of information management, digital libraries are systems which combines the technology of digital computing, storage, communication, the content and software required to replicate, emulate, and spread the services of cataloging, collecting, finding and publishing information presented by the traditional libraries which is based on paper and other materials.

From the point of view of a user of digital libraries, they are systems that offer a community of users with dependable access to a largely organized source or repository of information and knowledge.

Generally, digital library (digital repository electronic library; as sometimes referred to) is an intensive assortment of digital objects which can comprise of text, audio/video material, visual material, stored as [electronic media](#) formats (in contrast to print, [micro form](#), or other media in the traditional libraries), along with techniques for organizing, storing, and retrieving the files and media confined in the library collection and making them available online, in a searchable form.

V. STATEMENT OF THE PROBLEM

One of the problems with the traditional library and its manual methods of organizing of information and materials is that it does not license the concurrent or multiple use of the same library materials by different library users at same time – dissimilar to the digital library services. It is considered unproductive and time uncontrollable, hence the need to exploit the advantages of the digital library which provides all library functions and or feature and make them accessible online at all time.

Traditional libraries are restricted by storage space. A physical library has to employ large amount of money for the imbursement of staff, payment of rent, maintenance of book, and procurement of additional books. Library today, are made up of sophisticated tools that facilitate the finding of best information resources, delivering them to user's desktop, smart phones or mobile computing devices, which the traditional library cannot achieve. As to Michael Lesk [Lesk95] the biggest problem of the traditional libraries at the moment is the cost crisis now affecting their current services. Others problems are:

1. Lack of security.
2. Data redundancy
3. Unavailability of library resources at all time
4. Too much paper wastage.
5. Time consumption
6. Paper takes up a massive amount of room in the site.

The distance which parts the library user and the library is one major difficulty: the yearning to visit a library deterioration by the remoteness. Most users of the library basically lack the time to go to the library.

VI. AIM AND OBJECTIVE OF THE STUDY

The main aim of the research work is the design and implementation of an electronic library system for Niger Delta University. This research work will create a platform where users can access the library content without considering opening or closing time of the library.

VII. SIGNIFICANCE OF THE STUDY

Digitalization can offer numerous advantages to libraries and library users. Some of the benefits stated by T.B. Rajashekar ([Raja02]) are mentioned below:

- Digital libraries make it superfluous for user of the library to go somewhere. A user can access a deal of information right from his/her home or at work, provided there is a computer and internet connectivity.
- Library contents/information can be updated continuously and much more easily. Keeping information up-to-date is made easier.
- Information and library content can be shared with friends and family with ease. By placing digital information on a server connected to the internet makes it accessible to everyone
- Ubiquity: a single electronic copy can be concurrently accessed from a great number of locations by multiple users.
- Information replication is achieved easily and economically, whereas replication of paper material is usually very expensive

- Digital libraries in contrast with conventional libraries allow collaboration and exchange of ideas
- Digital libraries are considered economical, since expensive building is not required, employment of professional staff and maintenance necessitated by conventional libraries are not no longer relevant.
- Access to Information is not limited by geography, it does not matter where in the world the document located.

VIII. SCOPE OF THE STUDY

The verdicts of this study were completed in the library section of the Niger Delta University (NDU). The scope of this study includes storage of digital books and materials. The management, tracking of digital assets and naming conventions, and the capability of making them available online, in a searchable form, for easy access.

IX. WORKS RELATED TO DIGITAL LIBRARY

The history of university library development in Nigeria dates back to pre-independence time when the University of Ibadan and its library were established in 1948. As pointed out by Aguolu (1996), since independence in 1960, there has been unrelenting upsurge in the establishment of educational institutions at all levels especially university education. The proliferation of universities, despite the economic recession in the country since the 1980s, has increased the problems of the universities and their libraries so much that now their future seems uncertain. Added to these problems are the problems of ICTs in Nigerian universities as related to library development became obvious in the 70s, the developed world has devised various systems to simplify the flow of information both within and across countries. Developing countries are bidden to take lead of these devices. However, this invitation is not frequently willingly accepted by the developing nations like Nigeria due to some influencing factors. These include human factors, fear, and the

level of development-cum substructure of the nation. The instance of application of up-to-the-minute technology in the library should start with the acceptance of the new technology as these technologies had come to stay, not resenting with accept or not.

Libraries in Nigeria and their users gave the imprint that we don't know of the proficiencies and abilities of the ICT or that we don't need ICT to improve our services or that it will take jobs away from us. There is no area of library operations to which the computer has not been applied with incredible advantages. You can unconditionally state that libraries in Nigerian were neither here nor there in the past ten years. In the past decades, whatever has been done in terms of modern technological applications or automation has not interestingly gone deep enough to make any palpable influence. The incapability of Ibadan University Library to update its Serials Catalogue that were produced by computer in 1975 has cast uncertainties in the minds of several Librarians in relation to how energetic it will pursue their other automation and programmes in information technology.

X. METHODOLOGY

The methodology used for this research work is the waterfall methodology. Waterfall methodology is a methodical and chronological approach towards software development process and the phases are conception, initiation, analysis, design, construction, integration and testing, implementation and maintenance. Another methodology used in the research work is the use of Oral interview. Each stage begins or originates only after the previous stage has finished.

XI. SYSTEM MODULES MOCKUP

Designing system modules for digital libraries in the Niger Delta University required systematic examination of the university and lead to multiple system solutions. The studied system is divided into three (3) main modules; the administration module, the bursary unit module and the student/staff /user module. Each with different levels of functionalities, which are shown in the use case diagram below.

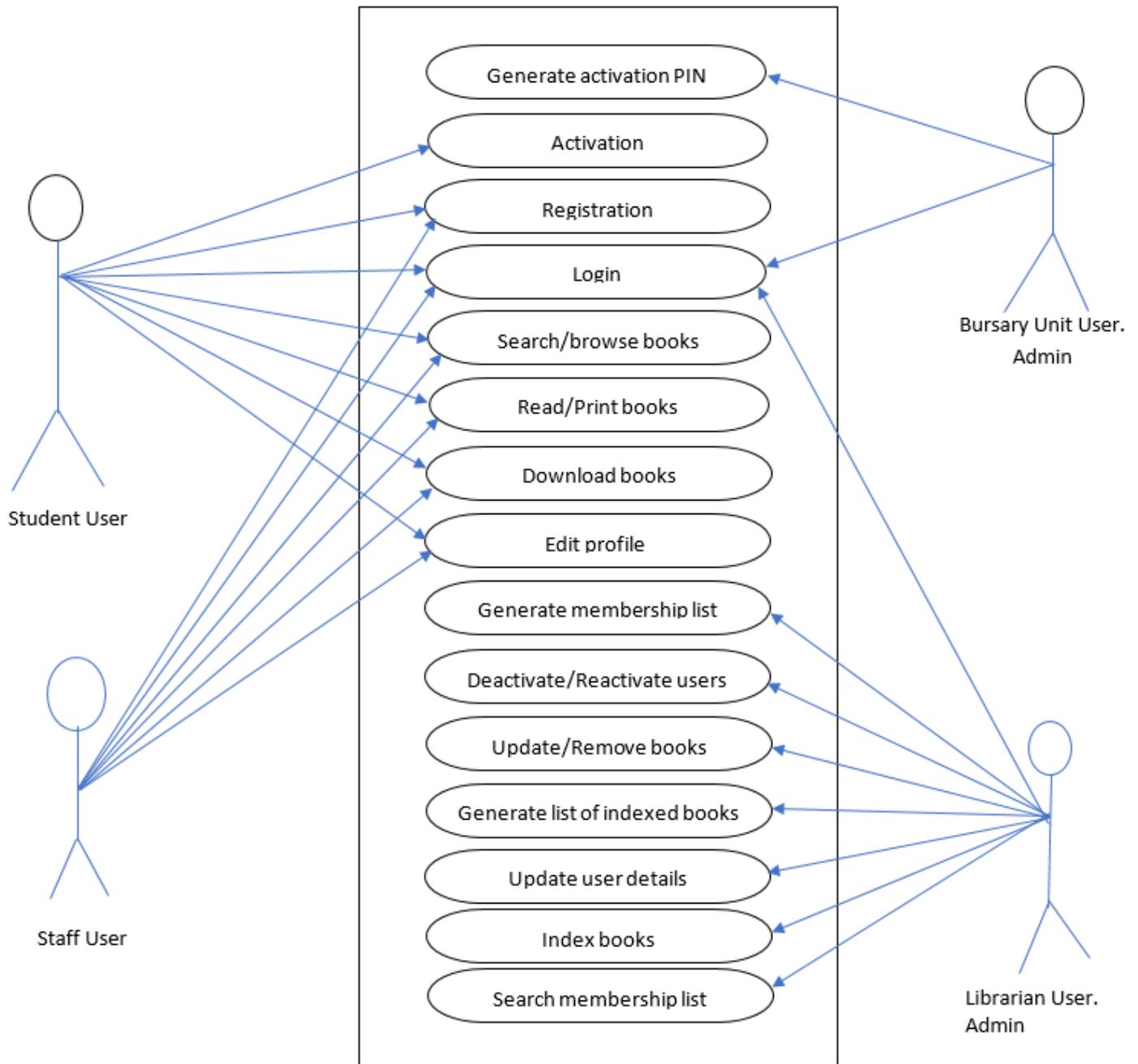


Fig 3.6.1 Use case diagram of the system

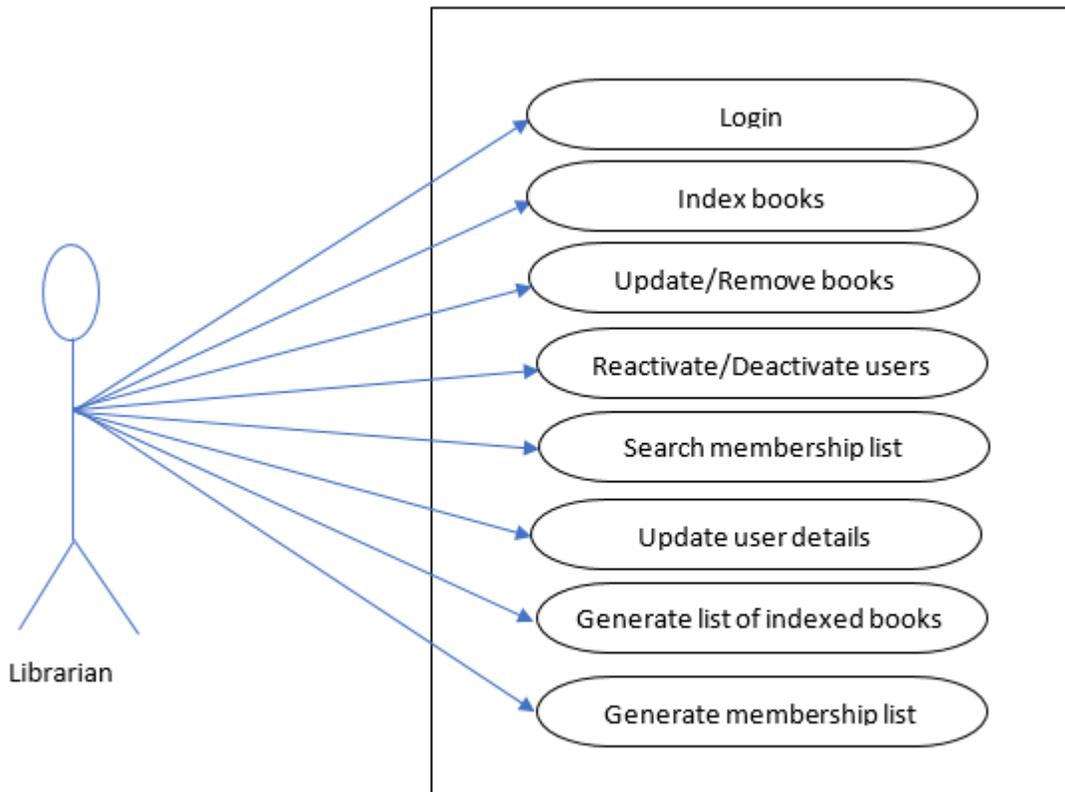


Fig 3.6.1 Use case diagram of the Librarian Admin.

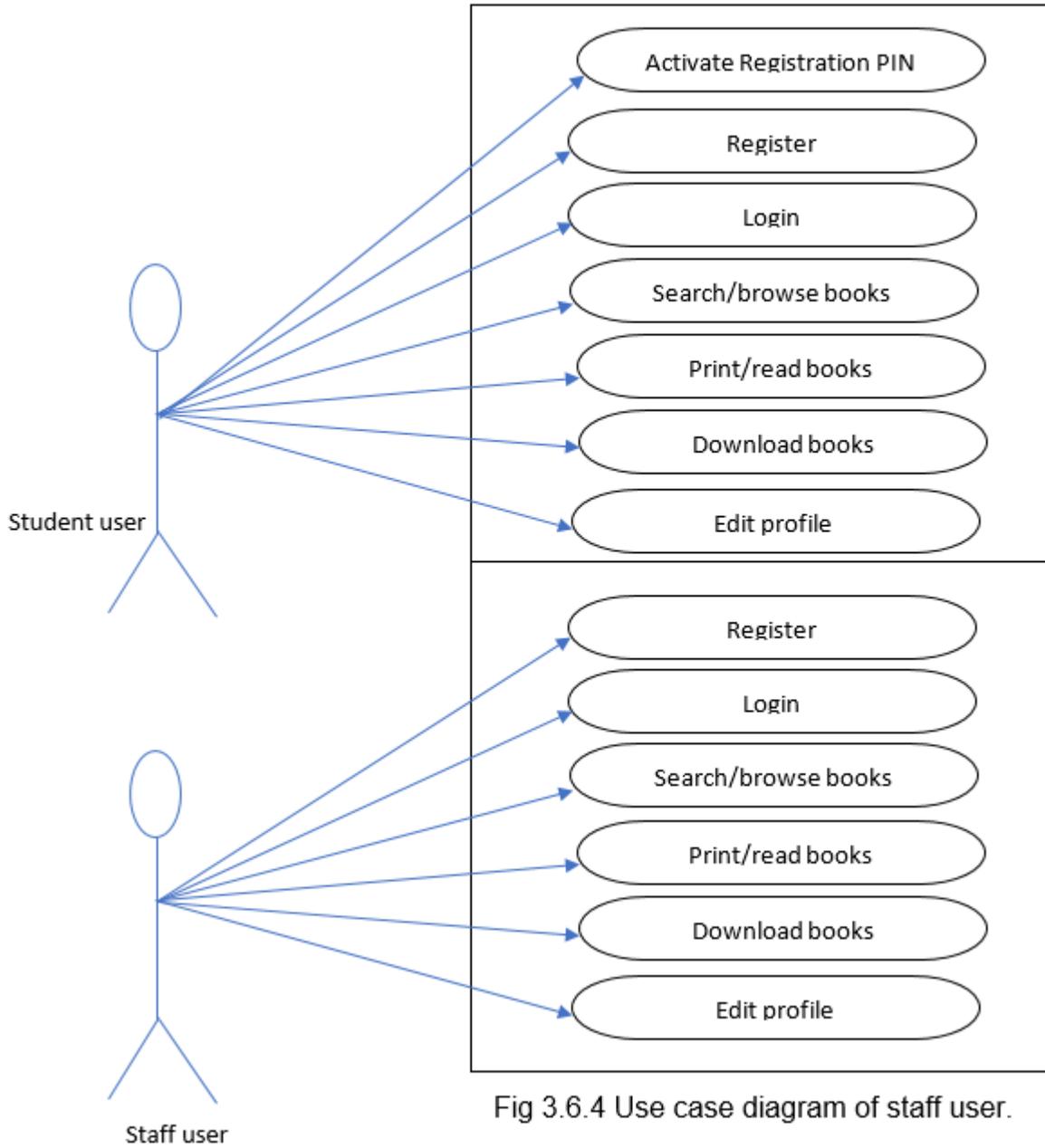
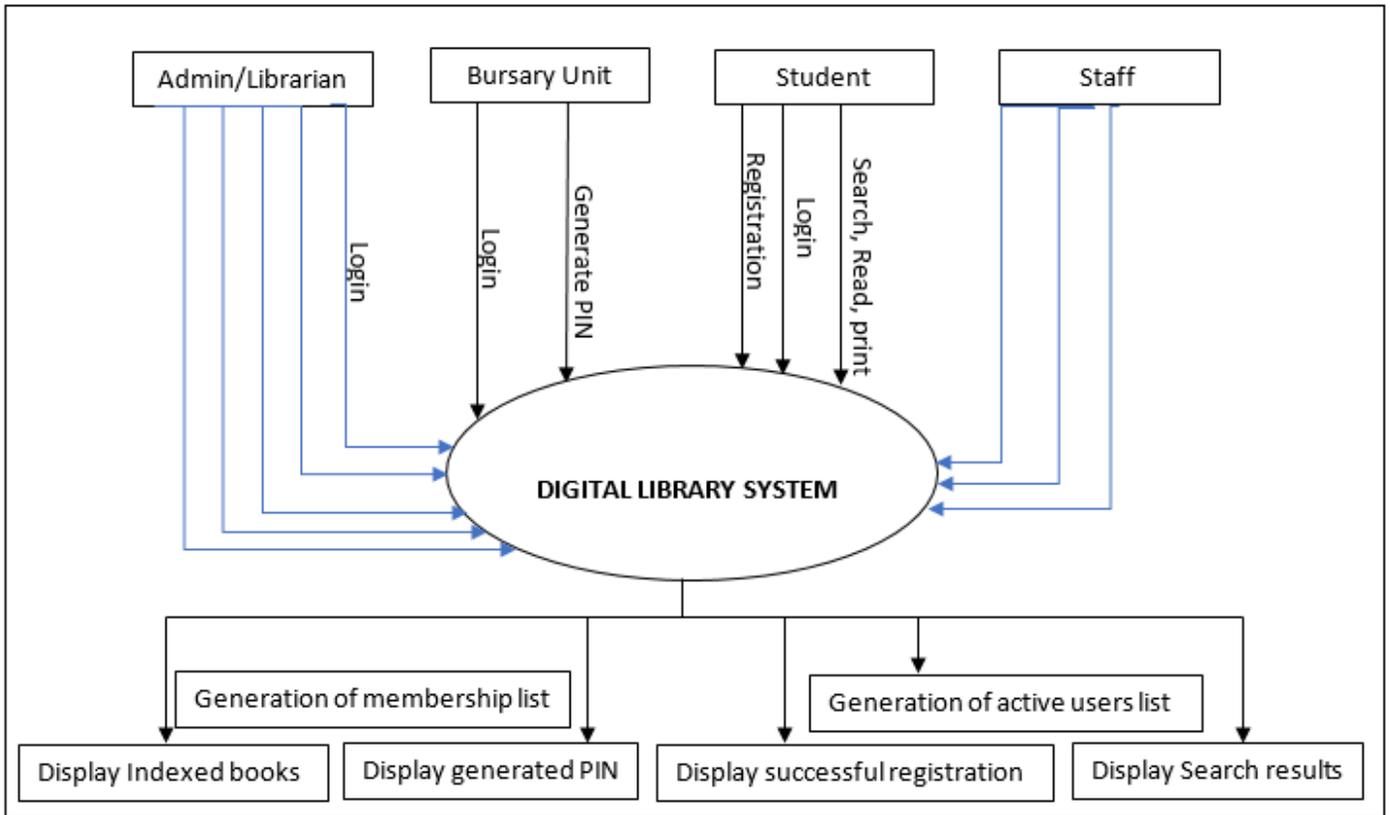
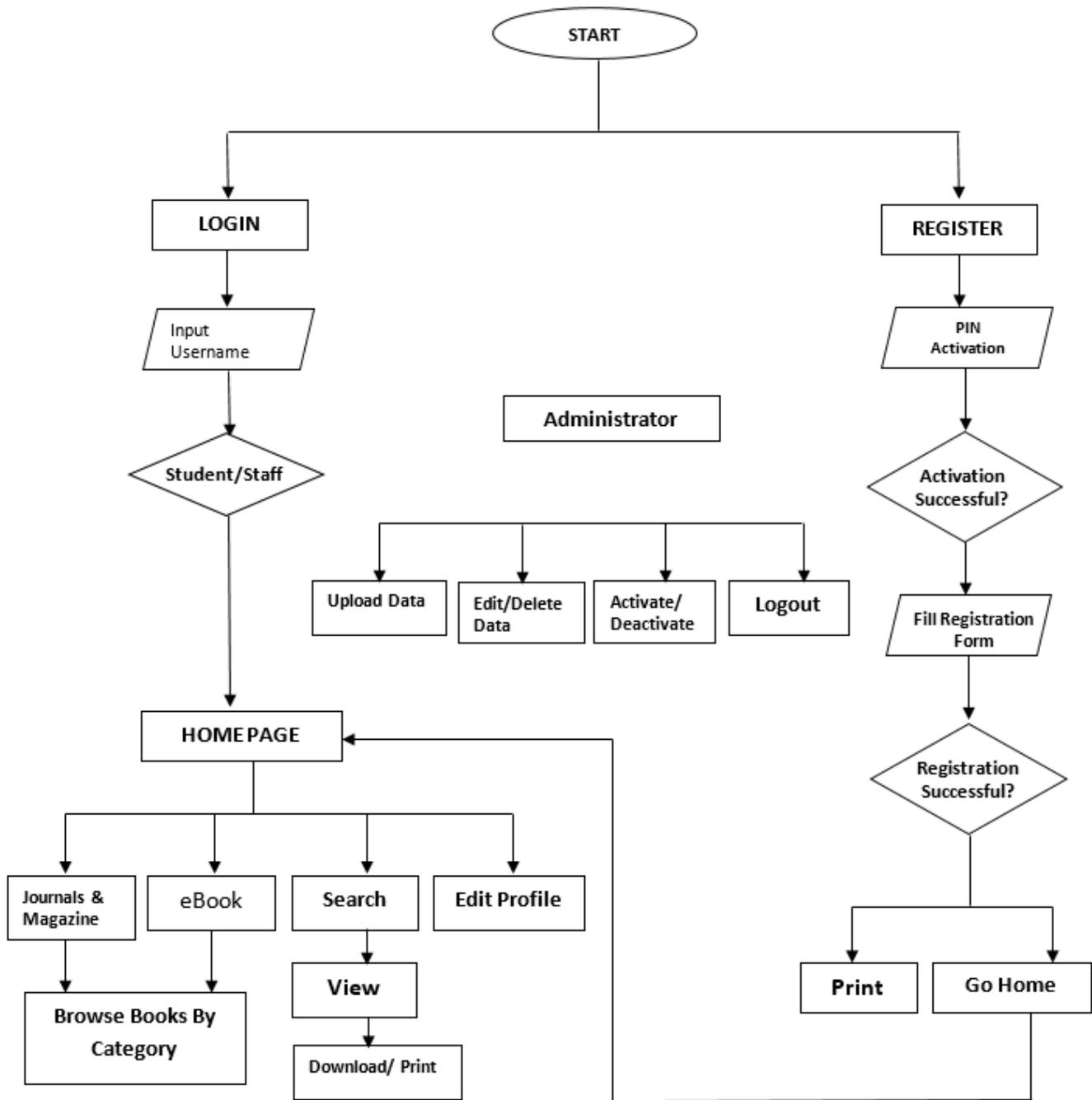


Fig 3.6.4 Use case diagram of staff user.



Level zero dataflow diagram of the system



Level one dataflow diagram of the system

Technology for Software Development

Multiple software technologies were employed in the development of the system. This is always the case in web application development. There is currently no one technology that does it all as opposed to desktop and mobile application development. These technologies include:

- HTML5 for webpage structuring and client-side scripting
- CSS3 for styling modules
- JavaScript for user feedback.
- PHP for server-side scripting

- MySQL Database

HTML5

The first thing to realize about HTML5 is, it is not a single entity. It is comprised of many elements, including the fifth revision of HTML, CSS3 and many JavaScript APIs. It allows you to use the multimedia experience of the desktop on the web. Prior to this technology, experiences of this kind could only work on the desktop. With HTML5, developers can create apps and websites that function like desktop applications, which allow you to use the web platform to reach all of your users at once. Users no longer have to download apps for multiple devices; they can start an app by clicking on a link or button and not have to worry about having the latest update. An interesting aspect of HTML5 is that it will allow you to create apps that function even when not connected or when your system is offline. The trick is being able to store the assets and content locally. When this done, the app works, regardless of where you go or if your system is online. Another positive aspect of the offline features is being able to store data in the cache or in such a way that allows the data to be retained even if the page is reloaded. With HTML5, you can make use of a wide variety of graphics elements, such as animation, games and movies (Nathan, 2013).

CSS

Cascading Style Sheet (CSS) is used to style modules and interfaces written in HTML, the language can be applied to any kind of HTML document. CSS is a cornerstone specification of the web and almost all web pages use CSS style sheets to describe their presentation. CSS is design primarily to enable the separation of document content from document presentation, including elements such as the layout, colors, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics, enable multiple pages to share formatting and reduce complexity and repetition in the structural content.

PHP

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language. As of January 2013, PHP was installed on more than 240 million websites (39% of those sampled) and 2.1 Million web servers. Originally created by Ramus Lerdorf in 1994. PHP originally stood for Personal Home Page, it now stands for PHP (Hypertext Preprocessor), a recursive acronym. PHP code can be simply mixed with HTML code, or it can be used in combination with various template engines and web frameworks.

MySQL Database was used for the database implementation of the system because it is flexible and easy to understand. The major reasons for using MySQL include:

XII. CONCLUSION

This study has recognized that digitization is an indispensable job in current day libraries. If a library is to live up to present challenges, it must go digital, that is, provide digital contents and services. This will empower it preservation of threatened library resources, improve the productivity of information search mechanisms and boost access to library resources. It is indispensable for the library management to provide policy guidelines and eloquent plans for the exercise. Digital library, also known as virtual library, has fully-fledged to a special field of study. Courses of training and research opportunities are now made available in this area of specialization by some university

XIII. RECOMMENDATION

With the knowledge of the significance of digitization, it is my suggestion that a yearly division or pecuniary allocation be made for it the use of library. This is necessitated due to the fact it is not a one-time activity. Libraries keep on obtaining materials, some of which have to be digitized. In Nigeria, ten percent of all financial allocations to the university are meant for the university library. Such practice should be extended to digitization exercise.

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Study To Check The Immediate Effect Of Pursed Lip Breathing Exercise Versus Relaxed Diaphragmatic Exercise On Heart Rate, Blood Pressure And Oxygen Saturation In Young Adults Of College Of Physiotherapy, Adesh University.

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Abstract- Objective: This study has been performed to check the immediate effect of Pursed Lip Breathing Exercise Versus Relaxed Diaphragmatic Breathing Exercise on Heart Rate, Blood Pressure and Oxygen Saturation in young healthy adults.

Method: 60 subjects both male and female were selected using random sampling method and divided into two groups (Group A and B). Pre-interventions readings of Blood Group, Heart Rate and Oxygen Saturation were taken. Subjects of Group A were instructed to perform PLBE and Group B to perform Relaxed DBE. Post-interventions readings of Blood Group, Heart Rate is taken by Digital sphygmomanometer and Oxygen Saturation by pulse oximeter (Oximeter Pulse Fingertip). Data were analyzed by student t-test.

Result: The study shows that statistically significant improvement in mean of BP (97.42 ± 98.25), HR (85.033 ± 84.93), SpO₂ (98.5 ± 99.43) in Group A. Mean of BP (93.58 ± 94.95), HR (89.83 ± 84.96), SpO₂ (98.06 ± 99.6) in Group B.

Conclusion: Hence from the result of the study, it is concluded that PLBE (Group A) is most effective technique (more significant) than Relaxed DBE (Group B).

Index Terms- Pursed Lip Breathing Exercise, Relaxed Diaphragmatic Breathing Exercise, Blood Pressure, Heart Rate, and Oxygen Saturation.

I. INTRODUCTION

Respiration is the process by which Oxygen is inhaled and Carbon dioxide is exhaled. It is a reflex process but it can be controlled voluntarily. Respiration occurs in two stages; initially inspiration during which the air enters the lungs from the atmosphere and later on expiration during which the air leaves the lungs. While passing through the lungs, the atmospheric air (inspired air) delivers oxygen to the blood into the pulmonary capillaries and in exchange, it takes away carbon dioxide from the blood.⁽¹⁾

Breathing is one of the most important and vital acts we do. It is one of the few bodily processes that can either be voluntary or involuntary. Breathing exercises can be defined as the

therapeutic intervention by which purposeful alteration of a given breathing pattern are categorized as breathing exercises.⁽²⁾ These exercises are frequently prescribed to reduce pulmonary complications after abdominal and thoracic surgeries.⁽³⁾ By traditional treatment, breathing exercises is well established in chronic lung disease, particularly where emphysema and bronchospasm are present.⁽⁴⁾

These exercises aim at assisting active expiration, teaching general physical relaxation, and increasing the efficiency of respiratory work, reduction in chest wall movement in deep respiration.⁽⁵⁾

It is known that the regular practice of breathing exercises increase parasympathetic tone, decrease sympathetic activity, improves cardiovascular and respiratory functions. It decreases the effect of stress and strain on the body and improve physical and mental health. Breathing is considered to be a regulator of the autonomic nervous system and consequently of mental processes.⁽⁶⁾ By voluntarily changing the rate, depth and pattern of breathing, the messages being sent from the body's respiratory system to the brain can be altered.⁽²⁾ Controlling the breath and thus calming the nerves is a pre-requisite to controlling the mind and the body.⁽⁶⁾

Pursed lip breathing (PLB) exercise is a type of breathing exercise that consists of two mechanisms, namely strong and deep inspiration, and active and long expiration. PLB helps the client to control the breath.⁽⁷⁾ It is a technique whereby exhalation is performed through a resistance created by constriction of the lips. Although the breathing maneuver is often spontaneously adopted by COPD patients, it is also routinely taught as a breathing-retraining exercise in pulmonary rehabilitation programs because it is thought to alleviate dyspnea and other respiratory conditions.⁽⁸⁾ PLB performed at rest promoted an increased abdominal expiratory muscle recruitment compared to control breathing.⁽⁷⁾

A pursed lip breathing prolongs exhalation thus prevents bronchiolar collapse and air trapping. It relieves shortness of breath and promotes comfort by reducing hyperventilation and increasing CO₂ levels in the alveoli. The increased CO₂ levels relaxes and dilates smooth muscles of airway, increase the ratio of

ventilation perfusion and also oxygen level in blood.⁽⁷⁾ In addition, due to healing effects of CO₂ on lung damage, gradual breathing control leads to reduction in dyspnea even in severe cases of COPD. Thus, the patient gains control over breathing, especially during exercise and at times of dyspnea.⁽⁸⁾ Pursed lip provide resistance to the air flowing out of the lungs. Thereby prolonging the exhalation and preventing airway collapse by maintaining positive pressure on the airway. CO₂ in the lung can be removed and O₂ fills more alveoli. High differences in the O₂ pressure gradient increase gas exchange in the alveoli to pulmonary capillaries.⁽⁷⁾ PLB causes the inspiratory muscles to work more optimally so that the burden on the inspiratory muscles is reduced.⁽⁸⁾

In Pursed lip breathing, subjects are positioned in a comfortable and relaxed position. Physiotherapist ask the subject to breathe in slowly and deeply through the nose and breathe out gently through lightly pursed lips as if blowing on and bending the flame of a candle but not blowing it out. It should be practiced 3 to 4 repetitions and then rest.⁽⁹⁾

PLB exercise causes decreased respiratory rate and work of breathing (oxygen consumption), also increases tidal volume (TV).⁽¹⁰⁾ Pursed lip provide resistance to the air flowing out of the lungs. Thereby prolonging the exhalation and preventing airway collapse by maintaining positive pressure on the airway.⁽⁷⁾

Increasing the amount of oxygen that moves to the pulmonary capillaries increases the amount of oxygen bound by haemoglobin and can bind SaO₂. oxygen saturation (SaO₂) is the ratio of oxygenated haemoglobin (HbO₂) thus increases the level of SaO₂.⁽⁷⁾

In Diaphragmatic breathing exercise, the subject's position should be half lying position and ask the subject to breathe in slowly and deeply through the nose while keeping the shoulder and upper chest quiet, allowing the upper chest rise slightly, ask the subject to relax and exhale slowly through the mouth. It should be practiced 3 to 4 repetitions and then rest.⁽⁹⁾

Diaphragmatic breathing exercise is a one of the relaxation technique which increases blood and oxygen flow to the brain to function in its optimal state.⁽¹¹⁾

Diaphragmatic breathing causes increased venous return to the heart. With inhalation, the diaphragm generates negative intrathoracic pressure, and blood is pulled into the thorax through a vacuum effect. This leads to increased stroke volume, which triggers arterial stretchreceptors and results in increased parasympathetic activity, and decreased sympathetic activity. These changes bring about decreased heart rate and total peripheral resistance.⁽⁶⁾

Diaphragmatic breathing increases baroreflex sensitivity and reduces sympathetic activity and chemo reflex activation. Baroreflex is the system in the body that regulates blood pressure by controlling heart rate, strength of heart contractions, and diameter of blood vessels. Deep breathing reduces the blood pressure and enhances baroreflex sensitivity, increases vagal activity and therefore decreases baseline heart rate and blood pressure. This is associated by improving vagal tone and by decreasing sympathetic discharge. Improvement in both sympathetic and parasympathetic reactivity may be the mechanism that is associated in those practicing the diaphragmatic breathing exercise.⁽⁶⁾

Diaphragmatic breathing increases blood and oxygen flow to the brain to function in its optimal state. It creates a connection between mind and body that can lead to greater self – awareness, mindfulness and clear thinking, improves circulation, which improves heart health, Energy levels and helps the body eliminate toxins, as well as reduce stress. Hence practicing diaphragmatic breathing exercise influence automatic functions and has therapeutic benefit.⁽⁶⁾

Diaphragmatic breathing causes increased tidal volume while maintaining optimal minute ventilation. The increase in tidal volume causes cardiopulmonary baroreceptor stretch which in turn leads to decreased sympathetic outflow and subsequently decreased peripheral vascular resistance.⁽⁶⁾

Diaphragmatic breathing increases heart rate variability (HRV), which is a proxy measure of the balance of sympathetic and parasympathetic influence on the heart.⁽¹⁰⁾

In all the cardiorespiratory problems and post-operative periods, the risk of pulmonary complications is highest. General anaesthesia and use of pain medication increase the risk of this complication as does extended confinement to bed. Breathing exercises initiated on the day of surgery and early standing and ambulation may reduce the risk of pneumonia or atelectasis. Also pursed lip breathing and diaphragmatic breathing exercises are commonly used in COPD and Asthma and in other respiratory condition. Hence study is undertaken to throw more light on the two physiotherapy techniques (pursed lip breathing and Relaxed diaphragmatic breathing) and their effect on BP, HR and SpO₂.⁽¹⁰⁾

II. MATERIALS AND METHODS

The present study is a pre and post interventional study, conducted on young healthy adults of college of physiotherapy, Adesh University, Bathinda. A total no. of 68 subjects were screened using the following proforma out of which 60 subjects met the inclusion criteria. The subjects were required to fulfil the following criteria to be included in the study: (1) age 18-25 years (2) Both male and female (3) participants willing to participate in the study (4) able to understand and follow simple commands. Ethical clearance from Ethical Research Committee of Adesh University was obtained prior to the commencement of the study. The purpose of the study was explained to the subjects in their language. All subjects signed an institutionally approved informed consent statement prior to data collection.

60 subjects were assigned into two groups (group A and group B). Each group consisted of equal number (30) of subjects. The subjects of group A were instruct to relax and positioned in a comfortable position so that the back and head are fully supported and abdominal wall relaxed. Then the Subjects were instruct to do PLBE by inhaling through the nose for two counts, keeping mouth closed. Then the subjects were asked to pursue their lips, and breathe out (exhale) slowly and gently through pursed- lips while counting to four. The intervention was applied for 3 to 4 times and then rest (for one minute), five sets were applied in a treatment session. Post-exercise readings will be taken [Pulse Rate (bpm), Oxygen saturation (%) and blood pressure (mmHg)].

The subjects of group B were instruct to relax and positioned in a comfortable position so that the back and head are fully supported and abdominal wall relaxed. Then the subjects

were asked to breathe in slowly and deeply through the nose, relax the shoulder and upper chest quiet following the abdomen to rise. Then the patient was instructed to slowly let all the air out through the mouth. . The intervention was applied for 3 to 4 times and then rest (for one minute), five sets were applied in a treatment session. Postexercise readings will be taken [Pulse Rate (bpm), Oxygen saturation (%) and blood pressure (mmHg)].

STATISTICAL ANALYSIS: Data were analyzed by student t-test (unpaired t-test). All data were expressed as mean±SD.

III. RESULTS

To assess the outcome measures of BP, HR and SpO2 in group A and group B. Unpaired t- test was used to compare the pre post values of BP, HR and SpO2. The calculated p-value for BP,HR and SpO2 was less than the table value when compared at 0.05% level of significance (df-29) .

Group A	MEAN	SD	P-VALUE
BP(PRE)	97.42	10.53	0.06403
BP(POST)	98.25	15.13	
HR(PRE)	85.033	11.53	0.477294
HR(POST)	84.93	12.13	
SpO2(PRE)	98.5	1.02	0.000323
SpO2(POST)	99.43	0.84	

Table 1.1: showing pre and post comparison of BP, HR and SpO2 values following exercise program of group A.

Group B	MEAN	SD	P-VALUE
BP(PRE)	93.58	9.24	0.277066
BP(POST)	94.95	11.04	
HR(PRE)	89.83	14.11	0.015454
HR(POST)	84.96	13.65	
SpO2(PRE)	98.06	2.17	0.000512
SpO2(POST)	99.6	0.61	

Table1.2: showing pre and post comparison of BP,HR and SpO2 values following exercise program of group B.

READINGS	GROUP A	GROUP B
SPO2(P-value)	0.000323	0.000521
BP(P-value)	0.06403	0.277.66
HR(P-value)	0.477294	0.015454

Table 1.3: showing The Comparison between the p values of group A and group B

IV. DISCUSSION AND CONCLUSION

The aim of the study was to examine the effect of PLBE and DBE technique on BP, HR, and SPO2 in 60 healthy individuals. Then pre and post intervention, readings were taken and compared to see the effectiveness of Group A and Group B. Findings of this

study revealed that there was statistically significant differences of HR, BP and SpO2 before and after PLBE and DBE. After the comparison between the Group A and Group B, it could be said that Group A is having stastically more significant difference of BP and SPO2 and Group is having statistically more significant difference of HR then the Group A.

This study is in line with the study of Budiono, Mustayah and Aindrianingsih indicated that the provision of PLBE has a significant differences of oxygen saturation before and after the exercise in COPD patients. Hence the result of this study support the current study because current study result shows that practicing PLBE has a significant differences of oxygen saturation before and after the exercise.

A study conducted by Ramos EMC, Vanderlei LMC et al. which indicate that practicing PLBE Produces changes in the RR, HR and SPO2 but not alter BP significantly .Hence the result of this study partially support the current study because current study result that practicing PLBE the HR is decreased, BP and SPO2 is increased . The possible mechanism behind the effectiveness of PLBE is that this kind of exercise improves the lung mechanics by prolonging the exhalation that increases the amount of trapped carbon dioxide and increase the transport of oxygen, so that the medulla oblongata is not stimulated to increase the effort of breathing because there has been a balance of gas homeostasis in the body, and this will stabilize the respiratory pattern to be effective. Through a strong and deep inspiration mechanism, PLBE helps increase the intake of O2 into the alveoli .The high O2 pressure in the alveolus compared with the O2 pressure in the alveolus compared with the high pressure of CO2 in the pulmonary capillaries, lead to increased gradient pressure of the gases between the two sides. The difference of high CO2 pressure also increases the gas exchange of CO2 diffusion from the pulmonary capillaries to the alveolus for subsequent expulsion into the atmosphere .Increasing the amount of that moves to the pulmonary capillaries increases the amount of oxygen bound by Hb and can bind the oxygen saturation. Hb is a component of red cells, which the increased number of red blood cells, which the increased number of red blood cells will automatically increases Hb levels.

A study conducted by Dr.Labiba Abd El-Kader Mohamed, Dr.Naglaa Fawzy Hanafy and Dr.Amel Gonna Abd El-Naby indicates that practicing slow deep breathing exercises decreases the systolic and diastolic BP as well as HR of patient with essential hypertension. Hence the result of this study partially support the current study because current study result that practicing DBE the HR is decreased but BP is increased. Similar findings were supported by study conducted on healthy individuals by tharion at al. in which there is also significant decrease in HR. The possible mechanism behind the effectiveness of DBE is that, this kind of exercise increases baroreflex sensitivity, which is a system in the body that regulates blood pressure by controlling heart rate, strength of heart contractions and diameter of blood vessels and reduces sympathetic activity and chemo reflex activation. It improves vagal activity and therefore decreases HR and BP. This is associated by improving vagal tone and decreasing sympathetic discharge .Improvement in both sympathetic and parasympathetic reactivity may be the mechanism that is associated in those practicing deep breathing.

After applying both the interventions, group A is compared with group B and hence the result of the two studies, it is concluded that PLBE is most effective technique (more significant) than Relaxed DBE.

CONFLICT OF INTEREST: None

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Analysis of Thematic Highlights of Nigeria's Newspaper Editorials

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Abstract- One important way newspaper and magazines bare their minds on issues and challenges in a society is through editorials. The editorial is a potent channel through which public and community opinions are measured. It is based on this premise that this study examines the relatedness of the editorial contents and contemporary issues in Nigeria. The focus of the study is to assess editorials as an agenda setting device. The study analyzed the editorials of Nigeria's newspapers to determine the contents and themes of presentation. The study analyzed 228 editorials from six Nigerian newspaper spanning three months (April - June, 2019). Findings showed that themes of economy and politics attracted largest number of editorials with 23.68 and 16.22 percent respectively. It was further revealed that judiciary, tributes and human rights are the least recurring themes. The study concluded that newspaper editorial contents are based on the activities going on within the context of the society.

Index Terms- Editorials, Newspapers, Themes, Agenda Setting

I. INTRODUCTION

The newspaper genre is a valuable medium of mass communication in the contemporary world. It is a channel that facilitates social integration and cohesion in a society. The newspaper is structured into bits and sub-genres. One of the popular sub-genres that gives credence to the quality and acceptability of a newspaper is the editorial. According to Merriam Webster Collegiate Dictionary, an editorial is "a newspaper or magazine article that gives the opinions of the editor or publisher". Similarly, American Heritage Dictionary cited in Ekeanyanwu and Jokodola (2009: 74) see editorial as "an article in a newspaper or magazine written by the editor, or under his direction, giving the opinion or attitude of the paper upon some subject". It is an article or a write-up that presents the idea of a newspaper on an issue. In other words, editorial is the official view-point of the newspaper and its proprietor(s) usually stated in accordance with the (editorial) policy of the newspaper.

Basically, editorials seek to influence actions of people, persuade them with an aim of redirecting policy decisions (Nnanyelugo and Obayi, 2013). In most occasions, the editorial plays the agenda-setting role to the people. In other instances, it serves as the medium through which public opinions are gauged by the political leaders and policy makers. This means that the editorial is an "eye-opener" that makes it possible for its readers not only to contribute to national discourse, but also to make them active and relevant in the developmental process of a nation. Therefore, analyses of editorial discourse always dwell on the strength of the editorial argument and the devices employed to convince the readers (Nnanyelugo and Obayi, 2013) which ultimately spurs them into action. Research findings have revealed that editorials have brought to the fore issues that are important to national development (Golan, 2010; Van Dijk, 2001; Pak, 2010). Additionally, editorial writers dwell on happenings in the society in the area of politics, economy, sports, health, culture and any other issues relevant in the polity of a country at a particular time or period.

Since editorials are written by experienced and seasoned journalists, the presentation is always precise and blunt. The commentary may however, be subjective because it is an opinion based write-up. The reasons behind writing of editorials are summarised by Ekeanyanwu and Jokodola (2009" 75) as follows:

Editorials provide the opportunity to help set the public agenda; editorial writers are getting the chance to have their voices heard in the making of policy. Editorial offers the newspaper the opportunity to have a well-informed subjective opinion on national and global issues that concern the public and, the editorial usually provides community leadership (in order) to reinforce and help clarify opinions that are already held, and to call the attention of the community to problems, projects and situations, and to press for community actions in such situations.

The inference here is that editorials are freely and authoritatively written to accommodate stories left uncovered by newsmen in their reportorial coverage of news and other assignments. This means that the “left-overs” can be brought to lime light and relevance through well-written editorials.

In addition to the agenda setting discursive role of editorial, it also has the freedom and opportunity to comment on actions and activities trending in the country. In line with this fact, recent developments in Nigeria have attracted editorial comments from different newspaper. For example, the imbroglio between the Islamic Movement in Nigeria and the Nigeria government been editorialized by several Nigerian newspapers such as Champion Newspaper on 22nd July, 2019, Daily Times (23rd July, 2019), Leadership (26th July), Vanguard (31st July), Daily Sun (August 5th), Nigeria Tribune (6th August), and The Nation (August 8th). Similarly, the ministerial nomination by President Muhammadu Buhari received editorial attention from ThisDay (28th July), Guardian (29th July), Tribune (30th July), Leadership (6th August), Vanguard (6th August) and Daily Sun (8th August). Also, the arrest and detention of the leader of Revolution Movement, Sowore received editorial attentions from the following newspapers: Daily Trust (8th August) and The Nation (9th August). In all these instances, the writers present different views ranging from advice suggestions, criticism, admonitions, warnings etc. In each case, the editorial is a follow-up to an earlier news story but the writers injected their objective or subjective opinions.

The newspaper editorial has become an attractive genre for researchers in language studies, mass communication, political science, sociology, etc. In this connection, there have been studies from different disciplines on the structure, language, findings, methods and relevance of editorials. For example (Pak, 2010; Takahashi, 2005; Lawrence, 2004) look at the discourse strategies of editorials. Also (Golan, 2010; Van Dijk, 2001) discuss on how editorials impact on public opinion. In other instances, Ani and Anyandike (2013) carry out a study on the contrastive study in newspaper editorials; Nnayelugo and Obayi (2013) examine the editorial behavior towards environmental disturbances in Nigeria; Farahman and Sanaz (2015) discuss the rhetoric of newspaper editorials; and Lawal (2015) research into pragmatics of truth and modality in newspaper editorials. None of the studies has shown interest in the theme and thematic patterns of newspaper editorials.

This study attempts to bridge the gap by looking at the thematic pre-occupation of newspaper editorials. It is meant to examine the thematic highlights (patterns) in the context of social, political, and economic situations in Nigeria. There have been happenings recently in Nigeria in the area of politics, economy, security, health, crime etc., thus making it ideal for such a study to be conducted. Understanding editorial thematic patterns of socio-political issues is imperative as it would educate newspaper readers on the need to depend on editorials for material agenda setting. Also, explication of the study may spur editorial writers into action to be more proactive, investigative, blunt, focused and objective in writing editorials.

Review of related literature

The review of literature for this study is done under two related sub-titles: roles of editorials and empirical review.

Roles of Newspaper Editorials

In historical precision, editorial stated to appear in newspaper in this middle of 18th century (Park, 1923). Specifically, according to Paul (1991), newspaper editorial was used in 1836 by James Gordon Bernet, the publisher of New York Herald. In the New York Herald at that time, he devoted some pages to his opinionated articles. Later in 1850, Horace Greenly replicated the experiment by setting aside one opinion page in “The New York Tribune” (Gartner, 2005). Right from its birth, editorial has revolutionalized the newspaper genre by shaping its structure, outlook and existence through the roles and functions that it has continued to play.

One major role of the editorial is its ability to express the opinion of the newspaper, its editors and management. In this regard, Van Dijk (1995: 243) says that “it is the function of editorials to formulate the opinions of newspaper editors... which are usually supported by a series of arguments...”

In another instance of editorial function, Gartner (2005) lay emphasis on the importance of editorials establishing and stabilizing the strength of the newspaper itself. In supporting this opinion, Park (1923: 281) says that “the power of the press is the editor and the editorial rather than the reporter and the news in which these writers are thinking”. Albright (2006) further his own view by perceiving the editorial as a way to change the especially in the face of modern technology. These opinions give credence to the fact that editorials is like sealing a bond with the readers by energizing their minds in order to express their own opinions.

Similarly, Omojola (2005) opines that the editorial could be an instrument of persuasion which ultimately influences public opinion on national issues. This view becomes realistic when a media organization feels that an event or situation deserves a change, and writes an editorial on such a situation thus making the medium to orientate the readers towards its belief or position (Ekeanyanwu and Jokodola, 2009).

Van Dijk (1995); and Belmonte (2008) in Elyazale (2014) present a more inclusive function of editorials thus: “editorials and comment articles play a definite role in the formation and altering of public opinion,

promote social interaction among journalists, readers and the rest of the participants in the language event and influence social debate, decision making..." The inference here is that editorial is a source of opinion formation to the reader and ultimately strengthens interaction between the reader and the writer.

Additionally, the editorial could give critical and in-depth analysis in national issues concepts and ideologies (Ekeanyanwu and Jokodola, 2009). Van Dijk (1995: 1) corroborates this view by saying that editors "try to reproduce their own (group) attitudes and ideologies among the public at large with the aim to legitimize the dominance and power of a specific group". It thus means that the editorial is a means to communicate certain ideology, concept and principle among the readers in an attempt to exercise some power on them. Conversely, the editorial can play the same role in which instead of speaking for the opinions of newspaper (the media outfit) it can speak for the ordinary citizen as Greenberg (2000: 1) cited in Ekeanyanwu and Jokodola (2009) clearly specified that "editorials assume an important communicative function by offering newspaper readers a distinctive voice that will speak to them directly". Here, "them" refers to the media men and women including editors, journalists, reporters etc.

To round off discussion on this issue, it is obvious that editorials display and perform diverse roles and functions as summarized by Ekeanyanwu and Jokodola (2009: 26) as follows:

... editorial might play an important (essential) role in maintaining the strength of the newspaper, through promoting and maintaining communication with the audience, and leading, the newspaper to take part in possible social change... These important functions seem to be gained through their argumentative nature and also through the language used in them.

II. EMPIRICAL REVIEWS OF EDITORIALS

Editorial discourse has become an attractive research area to scholars in the past decades. Scholarly works in different areas of editorials such as structures, strategies, functions, relevance, language, etc. Discursive dissect of editorial discourses as represented in studies (Van Dijk, 2001; Pak, 2010) have always emphasized the strength of the editorial argument and the devices used to convince the audience. Specifically, Pak (2010) conducted a research on three newspapers from three countries. The focus of the study was to examine source attribution as an argumentative device in newspaper editorials. Dwelling in a comparative approach, and collecting a sample editorial from three newspapers (New York Times, El Pais and El Universe), he examined the frequency of attributed statements, the typical source of attribution and the function of the year 1994. Findings from the study showed that while the American Newspaper (New York Times) placed high value on specialists and scientific reports, the Mexican and the Spanish newspapers (El Pais and El Universal) relies on other sources such as political figure to convince the readers.

The above study differs with the present study. For example, the present study examines editorial titles (subject matters) in relation to the socio-political and economic situations in Nigeria. However, the two studies are relevant to the understanding of the relevance of editorials.

Also, in an attempt to identify the persuasive strategies as well as looking at the rhetorical patterns and devices used in editorials, Fartousi (2012) carried out an analysis of the editorial discourse of the daily tabloid in Malasia. He tried to identify the element of generic structural abilities, their sequence and rhetorical figures used in the editorial. Findings revealed that there were a number of rhetorical devices/figures in the editorial, and that the devices were the ones influencing and persuading the readers of editorials. The study contrasts the present study in that while the above study focused on strategies used in editorials to help audience better realize and accept the intent of an editorial, the present study tries to draw the attention of the readers to the happenings and occurrences in the society.

In another study, Khan (2007) examined the theory that claims that the American mass media generally conform to the foreign policy of the US government; the study content analyzed the editorial coverage of Pakistan in the thace elite American newspapers between October 1999 and May 2007. The result showed that the theory of media conformity was not supported by available data bit rather, fall closely to the cultural difference theory advanced by Karim (2000) and Khalid (2001). The study concluded that there was a general bias against Muslims by American newspaper editorials (Nnanyego and Obayi, 2012).

Research has shown that newspaper editorials can be used as the voice of the community, the people and the nation in general. In this regard, Ekenayanwu and Jokodola (2009) carried out a study in which they analyzed the editorials of Nigeria's national newspapers in an attempt to determine their nature, content, type as well as quality of presentation. The main focus of the study was to assess the role of editorials in community conversation by analyzing their stand on community and national issues. Findings showed that the content of editorials most times depends on the issue pertinent in the country at a particular point in time, issues on the minds of the public and socio-economic issues challenging the society.

In another study, Farahman and Sanaz (2015) aimed at comparing the rhetorical devices employed in the editorials of the American newspaper. The New York Times, and the Australian newspaper. The Australian by using Richardson (2007) framework of rhetorical devices focusing on hyperbole, metaphor, and metonymy. The

focus of the study was to see the extent that language affects written conventions. The results showed that the editorials of the two newspapers employed the same rhetorical device categories; the categorical distribution of rhetorical devices was nearly the same in the two newspapers.

In summary, this review of literature has provided an overview of the existing literature on the area of editorials on issues of diverse importance and relevance. However, some gaps are identified. For example studies on editorial thematic patterns on highlights are absent. This study seeks to fill this gap and contribute relevant knowledge in this area.

Objectives of the Study

The aim of this study is to analyze the editorial content of Nigeria's daily national newspapers. Specifically, the objectives of the study include:

1. To find out the content (subject matter) of editorials in Nigerian newspapers;
2. To determine the frequency of editorial themes (subject matter) in Nigerian newspapers;
3. To examine the relationship between editorials in Nigeria's newspapers and the prevailing social, economic and political situations in Nigeria.

III. RESEARCH QUESTIONS

1. What are the contentual highlights of Nigeria's newspapers editorials?
2. Which subject matter(theme) is the most emphasised by the Nigeria's newspapers editorials?
3. To what extent does the editorials reflect the contextual realities of Nigeria?

IV. METHODOLOGY

Research Design

This study makes use of content analysis, which analyses the manifest content of communication or text. In gathering data, the editorial headlines of the sampled papers were collated through the use of statistical tools such as frequency, percentages, SPSS and Excel. Content analysis is the best method to draw data in accordance to the objectives of the study.

Sample Size

The sample size for this study is 228 issues (editorials) captured from six selected newspapers. Data were collected from the editorial pages of the sampled newspapers. The researcher deliberately conducted an examination of the editorial page of each newspaper to see if there is an editorial comment from such a newspaper for a particular day. The result of the search yielded two hundred and twenty-eight editorials from the six newspapers between the months of April and June, 2019.

Sampling Technique

Purposive sampling technique was used in selecting the six newspapers used for this study. Purposive sampling technique entails the researcher to deliberately select what constitutes his/her sample based on some predetermined purpose or aims which his study hopes to achieve (Ekeanyanwu and Olaitan, 2009, p.88). A census technique was subsequently adopted in which all the editorials in the sampled newspapers were examined. A systematic search of the editorial headlines of the 228 editions of the sampled newspapers was carried out to identify (and document) their contents. All the editorials were examined to assess and categorize their contents. The study performs a census of all the editorials in the Punch, the Vanguard, The Guardian, Blueprint, Nigerian Tribute and Daily Sun newspapers between April 1st and June 30th, 2019.

Unit of Analysis

The unit of analysis for the study is the newspaper editorials of the sampled newspaper. The researcher developed some content categories (themes or subject matters) that are relevant to the prevailing conditions to the Nigerian nation. The categorization was done to determine and analyze the editorial contents in order to place the content under a theme. These content categories are politics, economy, security, education, crime, religion, health, judiciary, foreign affairs, infrastructure, sports, parliament, and human rights.

Findings and Discussions

To achieve the objectives of the study, the content categories were developed and subsequently analyzed to find out how the newspapers have used their editorials to capture them(the categories) within the context of the Nigerian nation's activities. Answers were provided for the research questions: Discussions on the answers gave insight to the findings of the study.

Research Question One:

What are the contentual highlights of Nigerian's Newspaper editorials?

Newspaper as a mass communication device is a gauge through which societal activities could be measured. Table 1 below is a catalogue of the contents (subject matters) of the editorials used for this study. The subject matter and its themes are the issues and activities taking place within the country. The editorial writers are Nigerians; they feel Nigeria, they think Nigeria, so they are aware of what goes on in the country. The major issues discussed in the editorials for this study are politics, economy, parliament, security, education, health, crime, human rights, religion, foreign affairs, tributes, judiciary, sports, and infrastructure. Other issues that cannot be clearly accommodated in these broad categories are put under miscellaneous issues. Table 1 shows that the researcher identifies fifteen (15) themes and ninety-three sub-themes from two hundred and twenty-eight (228) editorials used for the study.

Editorial Themes	Sub-themes										Total
Politics	Election (11)	Political party (05)	Governance (14)	2019 Inauguration (04)	Democracy day (01)	June 12 (02)	-	-	-	-	37
Economy	National Devt. (07)	Economic policy (17)	Tax (04)	Debt (06)	Budget (02)	Energy (Petrol) (04)	Poverty (05)	Banking (02)	Capital market (01)	Labour (06)	54
Parliament	Bill passage (03)	Leadership (04)	Performance (01)	8 th Assembly (01)	9 th Assembly (01)	Media Relations (02)	Crisis (01)	Administration (01)	Pension (01)	-	15
Security	Police (13)	Military (03)	Terrorism (02)	Security Threat (01)	Sea Piracy (01)	Govt. Policy (01)	-	-	-	-	21
Education	Govt. Policy (04)	University (03)	Reading culture (01)	JAMB (03)	Language use (01)	-	-	-	-	-	12
Health	Breast feeding (01)	Disease control (04)	Facilities (01)	Drug misuse (01)	Female circumcision (01)	Smoking (01)	Govt. Policy (04)	Hazard (01)	-	-	14
Human Rights	Violations (04)	-	-	-	-	-	-	-	-	-	04
Crime	Prevention (02)	Killings (07)	Violence (02)	Banditry (01)	Drug trafficking (01)	Stealing (01)	Human trafficking (01)	Fraud (01)	Terrorism (01)	-	17
Religion	Easter (02)	Ramadan (01)	Leadership (01)	OIC memberships (01)	-	-	-	-	-	-	05
Foreign Affairs	Violence (03)	Leadership ouster (02)	United Nations (02)	Visa (01)	Hunger (01)	Diplomacy (01)	Democracy (01)	Econs Activity (01)	Political Crisis (01)	-	13
Tributes	Deaths (04)	-	-	-	-	-	-	-	-	-	04
Judiciary	Performance (01)	Structure (01)	Perception (01)	-	-	-	-	-	-	-	03
Sports	Chukwu's Illness (01)	Westernhorf Rewards (01)	Soccer (03)	-	-	-	-	-	-	-	05

Editorial Themes	Sub-themes										Total
Infrastructure	Building collapse (01)	Ports (01)	Rail (01)	Road (02)	Electric meter (02)	Decay (02)	Refineries (01)	Steel (01)	Air-Ports (01)	-	12
Miscellaneous	Population (01)	Admonition (02)	Tech Transfer (01)	INEC (01)	Nigerian Passport (01)	Commentary (01)	Culture (01)	Public Probe (01)	Safety (02)	Fulani Radio (01)	12
Total	-	-	-	-	-	-	-	-	-	-	228

Research Question Two:

Which theme(s) is the most emphasized by the Nigeria’s editorials?

Table 1 provides answer for this research question. Findings from the study as evident from Table 1 above indicates that the newspaper editorials used for the study focus more on economy than any other issues in Nigeria. This may be due to the fact that economy is the main yardstick used in measuring a nation’s development. Nigeria as a developing economy is battling with so many economic challenges such as poverty, unemployment, infrastructure, power, etc. Since the newspaper is the voice of the people, editorials focus more on economic issues than any other content. Economy and its sub-themes appear in 54 (editorials (23.68%). Politics is the next most emphasized content with 37 sub-themes (16.22%). The reason for this may be as a result of centrality of politics as the driving force of any nation. Economic development of a nation is largely determined by the politics of that nation. The political machinery co-ordinate all other activities of a nation. The next emphasized contents are security, crime, parliament and health with 21, 17, 15 and 14 themes respectively. Other moderately emphasized contents include foreign affairs (13 themes), education (12 themes) and infrastructure (12 themes). The less emphasized contents are religion (5 themes), sports (5 themes), tributes (4 themes), and judiciary (3 themes).

Emphasis on the editorial contents is determined by the centrality, sensitivity or importance of the issue in focus to the nation and its people. Issues that have to do with the progress, stability and development of a nation will definitely attract attention from newspaper editorials. It is for this reason that issues such as judiciary, human rights, religion and tributes attract little attention from the editorials used for this study.

Table 2: Level of Emphasis of the Editorial Contents of the Newspapers

Content (Theme)	Number of Appearance	Percentage
Politics	37	16.22
Economy	54	23.68
Parliament	15	6.57
Security	21	9.21
Education	12	5.26
Health	14	6.14
Human Rights	04	1.76
Crime	17	7.45
Religion	05	2.20
Foreign Affairs	13	5.71
Tributes	04	1.76
Judiciary	03	1.32
Sports	05	2.20
Infrastructure	12	5.26
Miscellaneous	12	5.26
Total	228	100

Research Question Three:

To what extent do the editorials reflect the contextual realities of Nigeria?

Based on the result of the study, the editorials in Nigerian newspapers are reflections of the socio-economic activities in the country. Each of the themes and sub-themes says one thing or the other about the political, economic, social or religious situations in Nigeria.

Table 1 presents the picture of these realities, and this answers the research question under review. Starting with the theme of politics which has 37 sub-themes adequately reflect the political setting of the period which the study covers (April – June 2019). For instance “election” as a sub-theme has 11 editorials to its credit; the same goes for governance with 14 editorials. The study was conducted during the 2019 general elections in Nigeria. Newspaper editorials like any other mass communication channel have a lot of things to say about the elections. Governance equally reflect the contextual setting of the period.

Economy as a theme in the editorials is another theme that reflects the setting of the period. The large number of sub-themes under economy fits into the words of Karl Mart who believes that the economy of a nation is the infrastructure while other things are superstructure (Ekeanyanwu and Jokodola, 2009). Two sub-themes; economic policy and national development, which jointly account for 44.4 % of the entire sub-themes under economy is a perfect reflection of a nation yearning for development.

The issues of security and crime that attract relatively high comments from the editorials truly reflect the security situation of Nigeria. There are a lot of security challenges in the country that justify the number of editorials. The 13 editorials for police as a sub-theme shows that the internal security (kidnapping, banditry, violence, etc.) of a country rests on its police.

The number of sub-themes under “health” (14) is abysmal considering the poor state of the health facilities in Nigeria. The attraction that “disease control” and “government policy” has is tolerable. However the focus of the editorials on “facilities” does not reflect the health needs of the country.

The issues of religion (5 themes), tributes (4 themes), judiciary (3), and to some extent human rights (4) could be assumed to be tolerably accepted within the context of the prevailing situations in Nigeria during the period of the study. Unlike the parliament (legislative), the judiciary is supposed to be a silent institution that does not need undue attraction. Similarly, religion is a personal affair between an individual and God and since Nigeria is not a highly fanatical nation editorial attraction may not be voluminous. The same view could be expressed for tributes and human rights.

The sizeable number of editorials that “parliament” attract is a reflection of the structure, leadership, performance and posture of 8th National Assembly that ended in June, 2019. The activities of that assembly is responsible for editorials and comments from newspapers and other channels.

The number of editorials on infrastructure does not negatively reflect the Nigerian infrastructure situation. Nigeria is in need of rapid infrastructure development. However, the number of editorials for each of the following sub-themes: ports, rail, steel does not represent the infrastructural needs of Nigeria.

On education, the available editorials do not reflect or justify the centrality and importance of the sector to the overall development of the country. As a pivotal sector of any nation, education ought to have attracted more editorials than what it got. The few ones that are available do not reflect the broad nature of the sector. For instance no editorials on facilities, administration, primary education etc.

In terms of volume (number of editorials), foreign affairs has 13 editorials; this is tolerable. When we look at sub-themes these editorials do not represent the reality of our diplomatic relations. For instance there is no editorial comment on the challenges faced by Nigerians in South Africa.

V. SUMMARY AND CONCLUSION

The focus of the study was to look at how the editorials of Nigeria’s newspapers reflect the socio-political realities of the country. A period of three months (April - June 2019) served as the study period. A total of 228 editorials were collected from six national newspapers. Findings showed that the categorical distribution of editorial contacts (themes and sub-themes) were nearly the same in all the newspapers used for the study. The study further revealed that economy and politics attracted more editorial comments from all the newspapers. It was noted in the study that economy, politics and security are the front runners in terms of editorial appearances, while judiciary, tributes and human rights were the back benchers.

Similarly, it was revealed that the Nigerian newspapers exhibit functional values of editorials in projecting the views of the people, that is, acting as the voice of the people of a nation. Finally, it was noted that, most often newspaper editorials base their contents and opinions on contemporary issues (and challenges) in the country at a particular period of time.

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Clinical Laboratories Accreditation based on ISO Standards

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Abstract- clinical laboratories' tests are an essential parameter affecting patient's diagnosis and treatment. Significantly, 60% of medical cases are diagnosed based on laboratory tests. Quality control system and ISO guidelines aim to improve clinical laboratories work process. In addition to that, accreditation authority plays an important role to guarantee continuous improvement and audit.

Index Terms- ISO, Accreditation, Quality Management of Clinical Laboratories

I. INTRODUCTION

Recently, medical laboratories tests play a significant role in diagnosis and decision making for therapeutic and treatment. Tests results are the most frequent data used by therapeutic, where more than 60% of medical decision are made according to clinical laboratories tests [1]. Quality of laboratories tests consider as an essential factor influencing the quality of total healthcare services. Therefore, the demand of quality assurance in clinical laboratories require a great deal of compliance and standardization by applying internal or national standards. The International Organization for Standardization (ISO) is a global authority aims to develop settings or standards guidelines for different type of facilities including healthcare facilities. In clinical laboratories, ISO focus to perform global harmonization of clinical laboratories around the world, including technical competence requirements and quality management system. Leading to accredit consistency of valid results by applying regulations and requirements for quality policy. ISO declared two protocols; ISO 15189 and ISO 17025 that described the quality management system and terminology. As well as, ISO guidelines improves the ability of clinical laboratories to produce reliable test results and enhance customer satisfaction [2].

During the last decades, the quality management system in clinical laboratories started with implementation of internal quality control followed by external quality control in daily and routine laboratories practice. One of the fundamental guidelines for internal quality management is the European standard (EN 45) for specifying general requirements of work process during laboratories tests. In parallel to that, ISO 15189 and ISO 17025 are an international standard for external quality management in clinical laboratories specifying the requirements for competence testing and calibration which is widely used around the world. However, guidelines for clinical laboratories standardization

include national and international standards applied in specific countries such as; Joint Commission International (JCI), Clinical Pathology Accreditation (CPA) which mainly applied in UK, College of American Pathologists (CAP) in USA and the CCKL guidelines of Practice in the Netherlands or standards based on the International Society for Quality in Healthcare (ISQU). Significantly, the common factor between all these standards is focusing on clinical laboratories accreditation based on ISO 15189 guidelines which precisely describing harmonization of clinical laboratories and define the requirements of quality management of work process and customer satisfaction.

II. METHODOLOGY

International guidelines for clinical laboratories accreditation were extensively studied based on standard protocols of ISO. Firstly, accreditation can be defined as a procedure by which an authoritative organization gives or issues a formal confirmation to recognize that certain healthcare facility or clinical laboratory is competent and capable to perform specific work process and clinical tests under certain requirements and regulations [3]. We found that the gold and the most recognized standard for clinical laboratories accreditation is ISO 15189. Specifically, the last version of ISO 15189 declared in 2012 has more and better structure toward work process, definitions of settings and associated with patient's safety. Therefore, the responsibility of laboratory manager is to define the job duties of each member and develop a strategic plan including prepare, practice and performance evaluation to be applied in harmony for successful implementation of ISO.

III. DISCUSSION

ISO 15189 is a significant tool to meet clinical lab accreditation. Mainly, the requirement for quality and competence by ISO 15189 strives to develop work process which is failure resistance as possible and enabling to detect errors before they become serious problem and to reduce the opportunity of mistakes. Also, the continuous improvement of work process is a key stone which is required to defined in synchronization to involve all staff in accreditation. Members of clinical laboratories must know exactly what to do, how to do, who is in command of a process and how to find all information necessary to achieve their responsibilities [4].

In the beginning, clinical laboratories arrangements, practices and procedures have to be intensively investigated and

examined to determine whether they meet requirement of standardization or not. Therefore, ISO 15189 categorized the requirements for accreditation into three main parts; management requirements, technical requirements and quality system essentials [2].

The management requirement of ISO demands regular reviews and internal audits to assure that work process and procedures are adhere and effective according to quality management system and continuously meet the clients needs. As well as, identification of continues improvement has to take place according holistically reviews based on suitability, performance of testing, relation to supplier, patients' satisfactions and implementing effective solution such as develop root cause analysis [5].

Besides that, technical management significantly focuses on precise job description and responsibilities with continuous evaluation of effectiveness for staff. Also, continues education

program should be performed to improve skills and knowledge of all members. In addition to that, accommodation and environmental conditions are essential in risk management to reduce risk of injuries and infections. Medical laboratory equipment and reagents should be suitable and compatible to achieve specific tests perfectly. Quality controller materials should be run periodically and documented to facilitate traceability [6].

The accreditation plan significantly focusses on main criteria that should be followed toward laboratories accreditation, including; establishment of well-educated team which should be keen with quality management procedures, methodology to apply accreditation plan which should describing the over all process of clinical laboratory tests, developing and improving strategies that can be updated continuously to over come any error source or limitation during the all process. Figure 1 represents the scope of accreditation process [7].

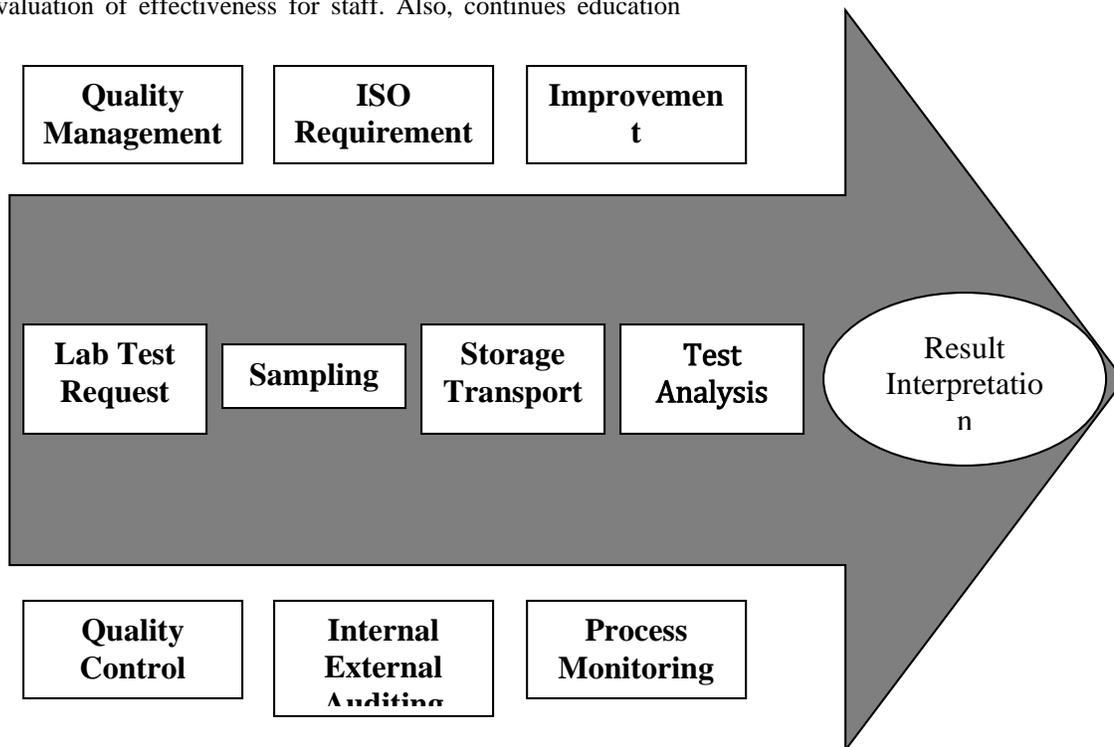


Figure 1: Scope of Accreditation Process

Significantly, ISO 15189 directed the framework of medical laboratories toward total quality management (TQM) system by using technical specifications that can be applied to achieve management requirements. Therefore, the quality cycle of clinical laboratories accreditation under the roles of ISO 15189 is applicable to cover all related field of clinical lab work process including; staff team, accommodation, laboratories' equipment, consumables and equipment's reagents, environmental condition, safety procedures, pre-examination and examination process [8]. Figure 2 shows the approaches of quality cycle of clinical laboratories based on ISO 15189. Firstly, the quality cycle describes the customer of clinical laboratories as patients or blood donors. Qualified staff team who achieve their job precisely at certain time to perform competence assessment. Also,

accommodation and environmental condition have been described as appropriate tools and facilities that should be undertaken to achieve TQM. Clinical laboratories' equipment, consumables and reagents are an essential part of TQM which have to be managed according to manufacturer's regulations including calibration, maintenance, storage and shelf life. All information should be documented and reported through the work process.

In addition to that, pre examination process should cover all patient and clinical tests information including sample collection, storage or transportation and handling. As well as, examination process should determine the optimal methodology to perform the requested laboratory tests and guarantee verification and analysis procedures according to biological references. Furthermore, post examination process focusses to apply quality control procedures to verify quality of control data, control materials, analysis and interpretation of results.

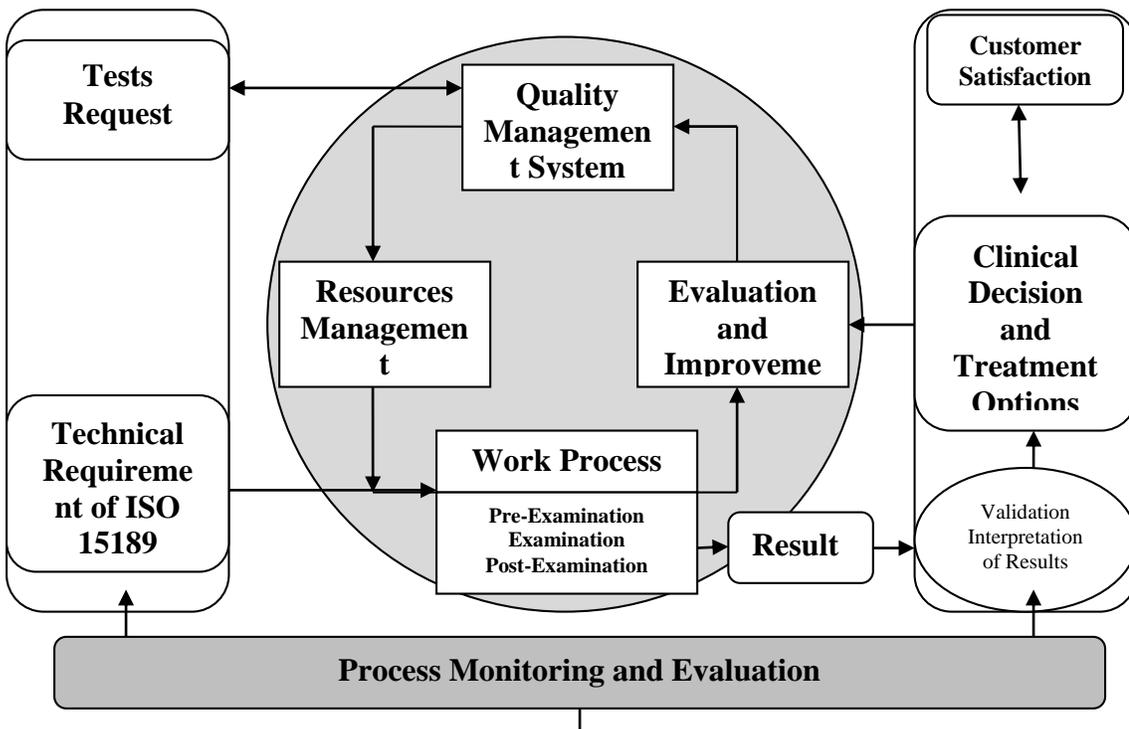


Figure 2: Quality Cycle of Clinical Laboratory Under ISO 15189

The continuous monitoring and evaluation of total work process can be designed based on internal and external quality assessment. Most of internal quality control design can be performed according to Westgard Rules or Levey-Jennings charts [9, 10]. Which suggested quality control design based on statistical and sigma metrics approaches [11]. On the other hand, external quality control suggested that clinical laboratories' work flow system should have the ability to perform corrective procedures when outcomes results consider as out of control or non-accurate.

IV. CONCLUSION

Accreditation of clinical laboratories promotes improvement of management system and technical capabilities for participated laboratories. As well as, the competitiveness level of clinical laboratories according to special specifications and guidelines issued by ISO 15189 would increase to achieve accurate and validated clinical tests that significantly improve clinical diagnosis, clinical decision and treatment options. However, accreditation body is a formal third-party authority that guarantee meeting the requirements of accreditation and perform periodic audits.

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Applications of Wearable Sensors: Continuous Monitoring and Healthcare Management

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Abstract- wearable sensors devices combined with smart phones applications play a significant role in better healthcare management for chronic conditions. As well as, communication technology and data collection and analysis provide a broad medical application for remote health care management.

Index Terms- Wearable Sensors, Vital Signs Monitoring, Flexible Sensors Array, Wearable Artificial Pancreas, Wearable Cardioverter-Defibrillator.

I. INTRODUCTION

The great development and improvement in modern technology offer a significant promise for digital healthcare system including cost reduction and patient care improvement. Implantable and wearable sensors as a major part of new medical technology which are contributing to switch healthcare facilities into mobile and wireless health era. Mainly, implantable and wearable sensors aim to provide and record real time data which enable healthcare providers to monitor, record, tracking, evaluate and prevent diseases. Implantable and wearable sensors have the ability to sense and detect various vital parameters and could be combined with transmitter to send collected data over remote healthcare centers. Enabling healthcare providers to direct their patients to specific actions or automatically perform medical action based on sensors reading.

In addition to that, implantable and wearable sensors have diagnostic properties based on physiological, biochemical sensing or motion sensing [1]. Leading to improve both diagnosis and treatment options for wide range of diseases related to neurological, pulmonary or cardiovascular disorders such as seizures, hypertension, dysrhythmias, and asthma. On the other hand, implantable and wearable technology is useful for rehabilitation treatment and diagnosis specially for elder patients in independence community.

Furthermore, early detection of disorders and clinical complications is a growing interest in medical field. Implantable and wearable sensors have the ability to detect any clinical changes in patient's status. For example, COPD patients can be managed successfully by wearable sensors to perform early detection of exacerbation episodes which is commonly defined by increased dyspnea, cough, and change in amount and character of sputum. Therefore, the significant aim is to prevent worsening of patient's medical status and reduce the need for emergency and hospital admission. In parallel, remote monitoring technology may be applied with wearable sensors to send collected data from

patients to central stations of healthcare provider to perform continues monitoring and assessment for clinical conditions [2].

II. METHODOLOGY

Implantable and wearable sensors are mainly composed of three subsystems including; hardware sensor to collect physiological and movement sings, communication system based on software and hardware components to transfer collected data to remote clinical center, data analysis work station to extract clinical information from collected physiological data. In advance, recent development in sensing technology based on microelectronics, biochips, flexible microelement and telecommunication play a significant role to improve the design and manufacturing of implantable and wearable sensors.

III. APPLICATIONS IN HEALTHCARE MANAGEMENT

The technology of implantable and wearable sensors covers a wide range of medical applications. Despite that the applications depend on clinical situations and conditions of patients. Clinically, implantable and wearable sensors aim to perform significant role in digital healthcare including; tracking, recording and monitoring the vital signs. Also, special care and management of diseases and disabilities could be achieved. As well as, different body parts may be monitored or evaluated during physical activity [3].

• Vital Signs Monitoring

Practically, vital signs monitoring, recording and tracking represent the major field of application of implantable and wearable sensors in healthcare. Essentially, heart rate, ECG, blood pressure, respiration rate, body and skin temperature are the most common signs that detected and measured. Commonly, heart rate can be measured and detected by special sensors placed on different parts of patient's body. Typically, Heart rate can be detected from patient's chest [4], modern technology of wearable sensors based on optical transducer, accelerometers and pressure sensors improve detectability of heart rate from ear, finger, wrist and rest [5]. Enabling monitoring and recording of heart rate during walking, running, sleeping and any other physical situation. In parallel to that, wearable and implantable sensors offer an advanced recording of heart rate with time-based plotting and history with global position system to improve analysis of collected data [6]. Furthermore, blood oxygen saturation which

represent the efficiency of breathing and blood circulation in the vessels. Detection principles of blood oxygen saturation commonly known as pulse oximetry, which is based on two light-emitting diodes (LEDs) at two wavelength 660nm and 940nm [7], that can be placed at different parts of patient's body such as ear or finger. On the other hand, body and skin temperature can be detected by wearable sensors from different part of patient's body such as mouth, rectum, eardrum, under the arm, and through the skin. However, preferred location to measure body temperature is near hypothalamus which controls body heat. Significantly, increase body temperature reflects disorders in the immunological system. Typically, body temperature measured by wearable sensors such as patches or earpieces [8, 9]. Furthermore, early detection and continuous monitoring of blood pressure is significant criteria to prevent and manage cardiac diseases. Therefore, wearable sensors aim to perform this role via wrist- and arm-based blood pressure monitors.

Recently, the advanced technology of wearable sensors combined with advanced design of semiconductors and flexible electronics materials which improve compact design for sensors with transmitter technology based on Bluetooth or wireless signal to transfer collected data to mobile application software or to remote clinical station. Flexible sensors array improves the ability of wearable sensors to collect data for various types of vital signs from one part of patient's body as shown in figure 1. The schematic diagram represents flattened bio sensors array with their integrated circuits that amplify and filter the detected signals, in addition to that transmitter integrated circuit was added to the flexible sensors array [10].

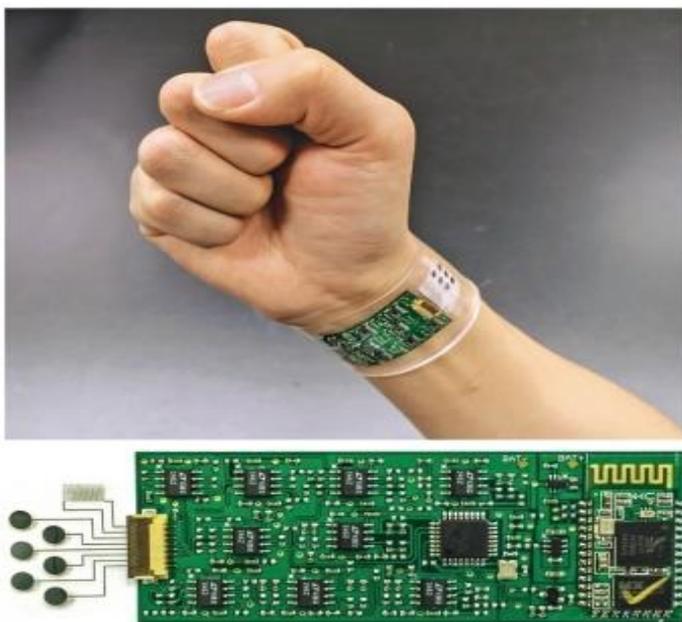


Figure 1: Flexible Sensors Array

Figure 2 shows a wearable sensor device using flexible sensors array that collect vital signs including ECG, Heart rate, NIBP and oxygen saturation from patient, then collected data transfer to mobile application which can monitor, record and analyze the collected data. In addition to that, the application has the ability to share the collected data to remote clinical station.



Figure 2: Wearable Device for Continuous Monitoring of Vital Signs Using Flexible Sensors Array

- **Management of Diabetes Mellitus**

Diabetes Mellitus is a chronic disease caused by pancreas disorders characterized by insufficient production of insulin leading to uncontrol level of blood glucose. Therefore, control and continues monitoring of glucose in blood is a significant role in clinical management of Diabetes Mellitus [11]. Recently, wearable artificial pancreas is commercially available to perform the function of monitoring and controlling. Mainly, the system is composed of three main parts including, measuring sensor which continuously detect the level of glucose in patient's blood, transmitter integrated circuit to send collected data from patient to mobile application which records real time data and analyzes the clinical situation of patients to determine and calculate insulin delivery based on computational algorithm, insulin injection pump that deliver calculated amount of insulin through patient's blood. Figure 3 represents wearable artificial pancreas.

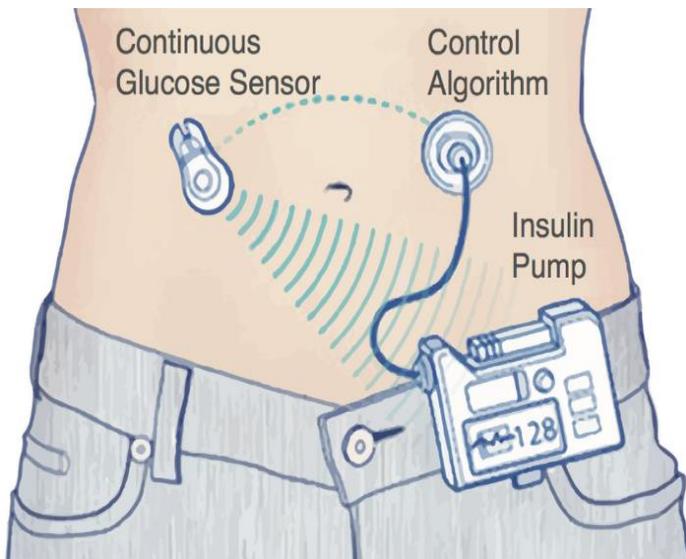


Figure 3: Wearable Artificial Pancreas

- **Management of Cardiovascular Diseases**

Cardiovascular diseases according to World Health Organization (WHO) consider as a major cause of death around the world, about 17 million people died every year because of cardiac disorders. Recently, the advanced technology of wearable devices improves monitoring and recording of ECG and blood pressure. Leading to improve patient's health and clinical diagnosis. Wearable smart patches based on flexible semiconductors materials and sensors play a significant role to detect and analyze ECG, blood pressure, heart rate and blood oxygen. Figure 4 represents a smart patch that detect and record heart vital signs in real time then the collected data send to smart phone via Bluetooth.



Figure 4: Smart Wearable Patch

In addition to that, it is widely believed that wearable cardioverter-defibrillator (WCD) improved the results of outpatients and increase survival ratio between patients suffering of cardiovascular diseases. Basically, WCD composed of device battery combined with defibrillator capacitor and signal processing unit that analyze and transmit the collected data from dry ECG electrodes, monitor unit works as loop recorder for continuous monitoring and recording of cardiac signs with real time. WCD looks like vest as shown in figure 5 which is worn under clothes [12].

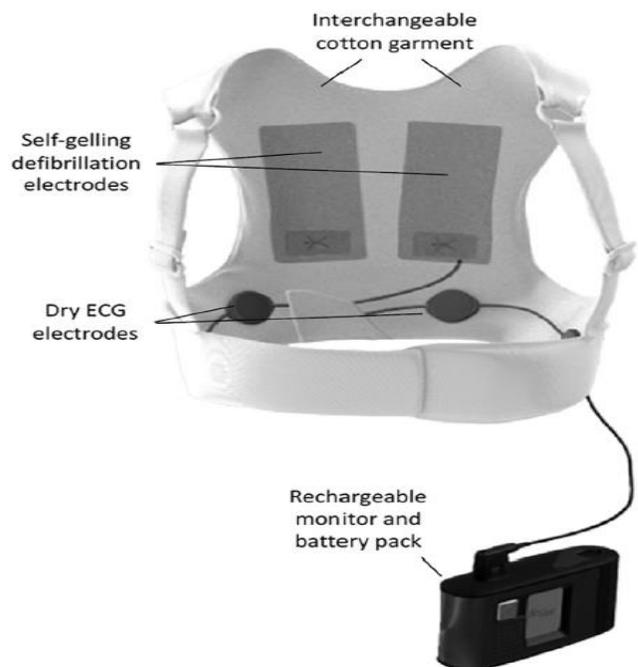


Figure 5: Wearable Cardioverter-Defibrillator

IV. CONCLUSION

Recent advancement of semiconductors, flexible electronics sensors, communication and smart phones application play a significant role to provide compact design of biosensors and wearable devices that improve continuous monitoring and recording of vital signs during routine physical activity. However, application of wearable sensors improves continuous monitoring which facilitate better option for clinical evaluation and clinical management of diseases. As well as, early detection of disorders could be recognized based on real time data collected by wearable sensors.

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A Novel Optimization Aspect of Osseointegrated Dental Implant

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Abstract- This paper highlights a new removal technique performed recently to osseointegrated dental implants utilizing a heating approach. This optimization technology ensures the uprooting of the capsule perfectly. Moreover, it ensures minimum necrosis of the embracing area.

Index Terms- Implant, Osseointegration, Denture Therapy and Optimization.

I. INTRODUCTION

Tooth loss, either of a single tooth or of more than one tooth, predominates in a significant percentage of the adult population in all over the world. The statistics behind this medical fact are dangerous. In fact, a report of 1985 and 1986 healthcare data illustrates the proportion of the adult population with one or both dental arches edentulous oscillated from 5% for those in their fourteen years old of life to more than 30% for those in their seventy years old [1]. These days, about 450,000 osseointegrated dental implants are being placed yearly. Not only this, there is an anticipation of 95% success rate (in the case of single tooth replacement with an implant supported crown), with minimal consequences and correlated impediments [2]. Typical comprehensive denture therapy, requires a clinical skill as well as art. Furthermore, this therapy proposes the patient a substitution for the natural dentition which is barely satisfactory at best. Earlier dental implant approaches utilized in clinical dentistry to improve the preservation of the artificial dentition positively amended the function as well as the security of the dental prosthesis. Nonetheless, each was interested in enough impediments and morbidity to prohibit approval by the different formal and confidential dental associations [3].

Furthermore, the osseointegrated implant is defined as a form of implants that identified as "an endosteal implant comprising openings into which osteoblasts and establishing connective tissue be able to roam". According to oral implantology, an osseointegrated implant implies a bone matured right up to the implant surface, not including the interpolated soft tissue layer [4]. Figure 1 below shows the differences between the way that natural tooth attaches to the bone and an implant attaches to the bone. From the figure, it is obvious that there is a difference in the tooth crown. In the natural tooth, there are fibers that serve as a holder for gum to the tooth (i.e. periodontal ligament). On the other hand, the bone attaches directly to the implant in a process called "osseointegration [5].

II. MEDICAL BENEFITS

In fact, the osseointegration process goes through several important steps. Starting with inserting the implant into the bone. Then, the healing process of the bone. This step should take some time to ensure perfect and healthy healing to the affected tooth. After that, a dental abutment is placed on the dental implant. Finally, the ceramic crown is placed which replaces the real tooth. Osseointegration dental implant goes through the surgical process. This process affords assistance to a dental prosthesis like bridge, crown, and bridge. Moreover, it offers assistance to the facial prosthesis and it gives help to make the facial prosthesis perform like an orthodontic anchor. A removal implant maintains denture and it is identified as the form of the dental prosthesis that is not installed perpetually in a place [5, 6].

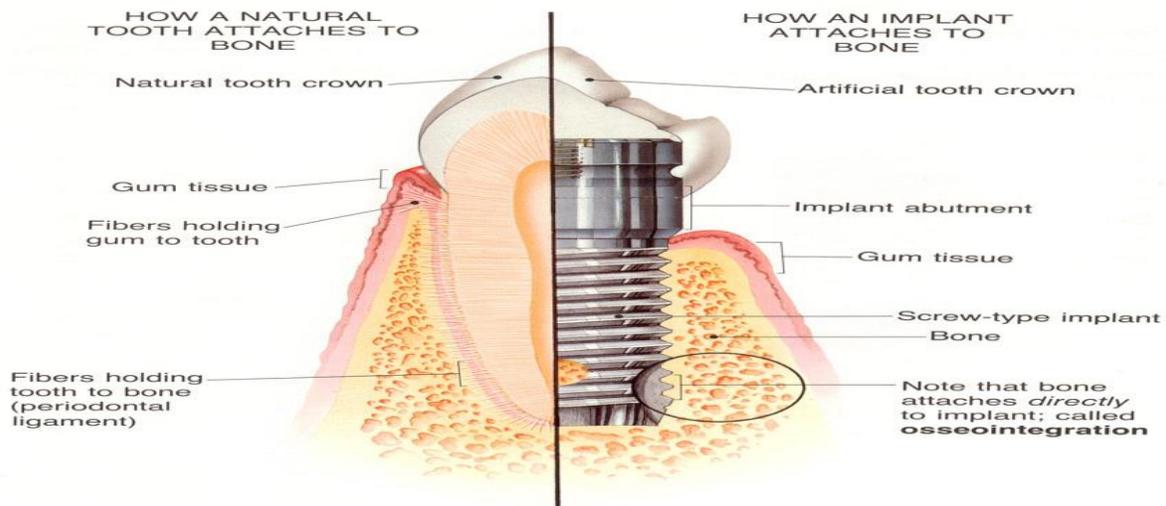


Figure 1: Differences Between Natural Tooth Attachment to Bone and Implant Attachment to Bone

Indeed, the dental prosthesis could be detached from the implant abutments by utilizing the finger pressure of the wearer. To ensure this happened perfectly, the abutment is designed as a little connector such as a button. This particular connector could be attached to comparable adapters in the underneath of the dental prosthesis.

III. OPTIMIZATION TECHNIQUE OF REMOVAL DENTAL IMPLANTS

With the development of science and the conquest of technology in various medical fields, new challenges have arisen regarding dental implants. Thus, professional engineers in medical devices to benefit from this science in this era. Moreover, computational patterning of sophisticated physiological systems and their collaboration with medical equipment has developed an essential field of biomedical engineering research internationally. The importance of this field is expanding to converge the market requirement for the spurt in the advancement of secure, well-performing and consistent medical equipment. Contemplating the whole clinical catastrophe consequences, their prevalence in the clinical procedure, the inquiry of undesired impacts and their influence is fundamental. In the layout procedure, these aspects ought to be considered. Furthermore, exhibiting and imitation affords sufficient and cost-effective explanation. A comprehensive and precise evaluation of exchanges of model variables is essential to distinguish the best preference from many hypothetically good layout choices of a medical device [7].

Consequently, incorporating various layout specialties, systematizing the simulation procedure and supporting layout evaluation with mathematical models perform a significant role. This optimization methodology maintains the accomplishment of dense biomedical engineering layout challenges with extraordinary improvements by means of time-saving, proficiency and consistency. Optimize a modern removal method of osseointegrated dental implants depends on a heating procedure. This technique guarantees the extraction of the capsule at the same time as certifying insignificant necrosis of the neighboring district.

Besides, two important embedded software are implemented. The first one is called modeFRONTIER and the second one is called ANSYS software integration between this two software is performed. This integration aided utilizing a two-step simulation procedure [8]. The first step implicated the adjustment of a numerical algorithm via scheduling different numerical variables such as heat transfer coefficient as well as material properties. This calibration process is performed to precisely simulate the heating procedure. The second step was the calibration of the removal procedure by realizing the best standards for the followings:

- 1- direction
- 2- duration
- 3- temperature
- 4- power of the heating instrument.

The integration between modeFRONTIER and ANSYS software enables the ability to establish a numerical algorithm to replicate the removal procedure in the most practical approach. Using this approach, engineers possibly will optimize the same process in a prudent and efficient method, averting the recurrence of numerous tests on patients or test subjects.

This optimization approach has some key advantages over the dental industry and opens more areas for scientific research in this challenge. The advantages can be summarized as follows:

- 1- Expand the understanding of the problem, taking all parameters and potential consequences into account.
- 2- Improve the consistency of simulation utilizing model optimization
- 3- Support minimizing the figure of luxurious models and pre-clinical experiments
- 4- Improve the safety of experiments
- 5- Minimize design times by supporting computerization of sophisticated simulation procedures
- 6- Integrate various design specialties for universal design

Figure 2 below shows the findings of the integration software and the new dental implant.

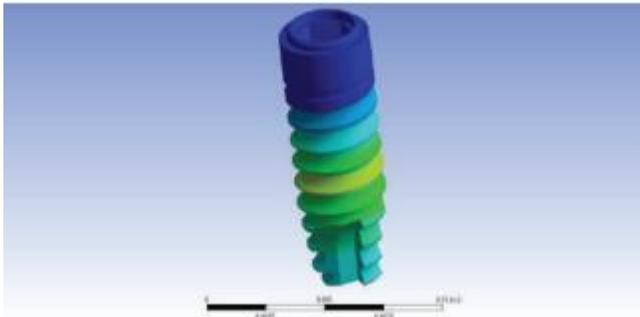


Figure 2: New Dental Implant

IV. DISCUSSION

With the ultimate accomplishment percentage of every tooth replacement opportunity and a track record straddling decade, implants are the most excellent long-term explanation to absent teeth. Appropriately caring for implants could save the remainder of anyone's life. This the reason that makes them such a good solution. In fact, during the natural process of osseointegration, the titanium metal is used to make the implant. This titanium made implant turns out to be blended with the living bone cells of the jaw. This extraordinary combination structures a robust as well as a stable anchor for the new teeth.

Dental implants are practically impossible to differentiate from the patient's actual teeth, in both aesthetics and function. Additionally, they offer a multitude of advantages that other tooth-replacement systems just cannot match. The visible component, which is the crown, is a ritual that is prepared to enrich the patient's smile, although the actual beauty of dental implants extends much deeper.

V. CONCLUSION

Dental implants become integrated into the bone itself. Dental implants stop the bone loss that inevitably follows tooth loss. The new optimization technique, preserving bone structure, helps to preserve the patient's appearance and helps to keep the patient confident.

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