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The Analytic of Property Business Model Development in Indonesia

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Abstract- The needs of Indonesia people to have a high-priced property and the acceptance of having a property is one of the best investment in their life is two key factors that lead property sector for growing rapidly. PT. Hasta Raya Utama is one of the developer company that focus on this sector, since it was established in September 2014, PT Hasta Raya Utama has run 6 projects in 5 different locations. The business model of PT Hasta Raya Utama at this time has strength and weakness. The strength from business model is PT Hasta Raya Utama has strong key activities. Whereas the weakness of the current business model is less-notice about customer relationship so that their loyalty may be decreasing because there is no good customer relationship program from the company. As a suggestion to fix the business model, then there is should be an alternative prototype of the business model that is the customer segmentation concept to a good institution both government or private. This concept is focusing on speeding up the processing of a project and making sure the company cash flow. To support this business model prototype then one of the key activities that play the biggest role is welcoming the networking optimally. This prototype is chosen in order to make stream revenue is not affected by the macroeconomic condition.

Index Terms-property industry, business model canvas, SWOT analysis, customer segmentation, value proposition

I. INTRODUCTION

The growth of property in Indonesia is growing rapidly. According to Schreiben (2013), Indonesia is now encountering a high level in the acceleration of property industry, whilst in other country it is now getting slower. Moreover, the findings of Urban Land Institute's research (2013) stated that, Indonesia, in 2013, lies on the first rank with Jakarta plays an essential role to be the most interesting investment centre in South East Asia. Yet, in previous year Indonesia only reach 7th rank. The growth of property in Indonesia is dominated by residential and commercial property for daily routines in that city. The residential development in Bogor, Bekasi, Depok, and Tangerang region were supported by government by giving permissions for the location of residences in 132,668 acres (Business Intelligence Report, 2009).

By the growth of property business, it evokes a plenty of competitions in this sector. Related to, every companies are challenged to have a good corporate performance that can guarantee them of being competitive and do some strategies properly through a lean business model, in order to be able for competing with other companies. From this condition, therefore, it will be conducted a research focusing on one of the property company that is now in the growing level, PT Hasta Raya Utama, that the proves can be found from the revenue gained by this company that tend to be growing. In 2015 there were two projects by PT Hasta Raya Utama compared to 2014 (1 project) that has been done. PT. Hasta Raya Utama is a developer company that is running on property sector, was established in 3 September 2014 with the deed of establishment number 13 from public notary Dwi Sundjajik, SH, M.Kn. As a new player in property sector, PT. Hasta Raya Utama should has a lean business model and can be relied on in order to keep it and reach the objective of the company. Thus, to reach those goals, PT. Hasta Raya Utama needs short-term, middle-term, and long-term plan that can be applied comprehensively and well-managed with the main focus in the development, expanding and marketable product.

Since the first operation in September 2014, PT Hasta Raya Utama has finished 3 project in 3 different locations. PT Hasta Raya Utama, currently, decides to focus on the activity in property, which is cluster residence, because this type of property is assumed as a low-risk. Besides from the activity that is not need a heavy-tool, also because in running the cluster business is not need involve much parties. PT Hasta Raya Utama is a new player in the property industry, that simultaneously understanding the flow of this business sector, PT Hasta Raya Utama feels it is necessary to have a strong ability and skill in this sector before deciding to involve more parties.

II. MATERIAL AND METHODS

The methods that is used in this study is qualitative methods. This qualitative methods is focusing on the methods that is used to examine a fundamental object study in which researcher play a role as a key instrument, sampling taken from the source of the data is using a thoughtful sampling, data analytic put as inductive / qualitative and the result merely emphasises the meaning rather than generalisation (Sugiyono, 2010). Some of the methods that is used in this study are observation, interview, and documentation. This three methods are used to gain data and information that is needed to answer the question from the formulation of the research problem. Below is the explanation of the methods that is used in this study :
1. Observation / Field Monitoring

Observation technique is used to gain supporting data about real and objective condition PT Hasta Raya Utama in this current situation by observing directly and thoroughly about every cases that are related with research object. In this research that is done in PT Hasta Raya Utama, this method is done by doing observation in head office. Head office observing is done to know the business activity in the company and collect the data that will support the interview result.

2. Interview

In the interview that is done in PT Hasta Raya Utama is done by an unstructured and semi-structured interviews. Semi-structured interview is done by writing guidance question and directly questioning to the commissary, director and manager. The answer of the questions is written in paper where the guidance question also written there. Whereas unstructured interview is more digging up the information deeply about the real condition of the company.

3. Documentation Study

Documentation study is done to gain the number of data and information from the field, for instance administrative documents, that is purposed to complement data gained from the interview result and observation that is conducted by researcher. Those documents from PT Hasta Raya Utama are sales data, products type data, employee data, customer data, social media data, and website data.

Type and Data Source

This study is using primary and secondary data that is conducted to become an information. Primary data that is conducted from the direct observation in the field and direct interview with the stakeholders which are competent (as key persons) from PT. Hasta Raya Utama. Stakeholders that become correspondence are commissary, director, top level manager. Tools or methods that is applied to collect the primary data is direct interview and using questionnaire.

Secondary data will be obtained from the archive or data that has been documented by the company, PT. Hasta Raya Utama. Other secondary data that is supporting data and additional data are obtained from the Real Estate Indonesia (REI) database, Central Bureau of Statistics District Level, Kabupaten, and Library.

Respondent Methods Decision

This study determines respondents by using purposive sampling method. Purposive sampling is a method that will determine the respondents by selecting them intentionally and by consideration from researcher that is expected to give the accurate answer and information according to the knowledge and experience that is had. Purposive sampling is used to choose competent stakeholders and fully responsible to their own field, that has clear and complete information of PT. Hasta Raya Utama. The identification of strategic factors are done by an interview with some internal stakeholders that are; MAIN commissary, CEO, and top level manager.

The implementation of SWOT Matriks :

Below are the steps that is done in arranging SWOT Matrics;

1) Making list of external opportunity factors of the company
2) Making list of external threat factors of the company
3) Making list of external strength factors of the company
4) Making list of external weakness factors of the company
5) Identify the strategy that is done by matching the strength and opportunity that will be a SO strategy
6) Identify the strategy that is done by matching the weakness and opportunity that will be a WO strategy
7) Identify the strategy that is done by matching the strength and threat that will be a ST strategy
8) Identify the strategy that is done by matching the weakness and threat that will be a WT strategy

III. RESULT AND DISCUSSION

To be able for planning and doing business strategy that will be applied by PT Hasta Raya Utama, thus, we will visualise the business model first that is happen in the current situation through business model canvas that includes 9 element that correlated one to another, meanwhile the result of the observation based on the business model canvas are :

Customer Segments

The determining of customer segments will give an impact to the revenue streams, it will be resulted by the company and customer segments in the current situation of PT Hasta Raya Utama such as :

- Households that have not yet had a house, even they have enough income to buy a house based on the price of the residence built by PT Hasta Raya Utama (De Viva)
- Evicted households in the middle of the city and have enough funds to from the eviction and want to find a new house in the rural area.
- And retirees that want to have a house in rural area of Jakarta
Value Proposition

In order to keep staying in the middle of property business competition, therefore value proposition become a key factor of a success parameter in this business sector. Value proposition in this case is related to legality that is obtained by the customer such as; ownership certification, building permit that has been managed by PT Hasta Raya Utama. Besides that, another factor is a flexible payment methods

Channels

Channels is about a media that is utilized by company to build and maintain a relationship to reach customer segmentation so that they can give the value proposition. In this current situation, the way PT Hasta Raya Utama do the channelling is by arranging property exhibition in nationwide level, social media, and website PT Hasta Raya Utama.

Customer Relationships

To guarantee the continuity and achievement of a business, it needs to be identified the correlation that is made based on their segmentation. In the case of maintaining this relation, thus, at this time, what PT Hasta Raya Utama do is give a guarantee in which up to 3 months customer get the house since the handover is done.

Revenue Streams

Revenue Streams or the flow of the incoming funds describing how this property get the funds from every customer segment. Current stream revenue in PT Hasta Raya Utama is from the transaction income of each house units.

Key Resources

Key resources are the most important description assets that determine the achievement of property company in doing their business model. The key resource that is owned by PT Hasta Raya Utama is from physical, intellectual, and human resource.

Key Activities

Key activities in property company is activities which inside of it includes several purposes to grow company value. Now, the main activity of PT Hasta Raya Utama is to keep innovating in every new project by continuously listen to customer complaints as a positive input for the keep-growing company.

Key Partnerships

Key partnerships is a company partner in property sector to support operational of the organization. In this time by the limitation of resource company still keep maintaining a good relationship with any other partner, which all of those partners are : Bank, Notary, BPN, and Government Office near the area.

Cost Structure

Cost Structure is a figure of all of the cost that will emerge when company operates the running business model. Now the cost components in PT Hasta Raya Utama is fix cost, variable cost, and other cost.

Below is the portrait of nine element that related each other from the approach of business model canvas that is happen in current time :

SWOT Analytic of the Elements of Business Model PT Hasta Raya Utama

From the identification result of the business model elements of PT Hasta Raya Utama, thus each of the elements are analyzed by using SWOT analytic. Results from this SWOT analytic can be used to refine or renew the current business model. Below are the SWOT analytic of the nine elements business model:

. Customer Segment

The strength of customer segment in PT Hasta Raya Utama at this time is not limited only on certain segmentations criteria, but more broader aiming buyer from all customer segment. The weakness of customer segment model is they have not yet able to aiming the specific and clear target from which gment that will be focused on. Opportunity that can be taken
from is by narrowing the customer type and customer target so that it will be able to focus on the target, easily do the marketing, and get the insights from the customer. The threat from this segment customer model is there are more competitor that will be competing in this market.

b. Value proposition

The strength of PT Hasta Raya Utama company is to give complete legality up to ownership certification. The weakness is it needs more time to process the house legality. The opportunity that can be grewed up is value proposition can be more emphasized on the legality process in which the process will be more quicker by placing certain people to take control the legality needs. The threat is the legality is easily copied / duplicated by the competitor and they sometimes can place better value proposition on it.

c. Channels

The strength of channels elements is it has broader market connection because of the above the line (ATL) promotional activity like Facebook, Twitter, and following exhibition in nationwide scale twice a week. the weakness of this channels currently is there are a lot of marketing channel product that can not be utilized properly because of the lack of human resource in the company. Opportunity that can be applied is by welcoming freelance marketing to deal with marketing activity. The threat is competitor is more quicker to strengthen their ability in managing channels.

d. Customer Relationships

The strength of the applying customer relationship at this time is the house guarantee every three months, so that customer will feel convenient and calm if there are complaints of the house condition or quality that has been bought. The weakness is there are a lot of customer that still feel the guarantee is less, moreover if they buy in the dry season, that the condition has not been known in rainy season. Opportunity that is expanded is by applying guarantee time extension that giving additional cost for the customer. The threats of applying customer relationship program at this time is competitors will be able to apply better customer relationship program.

e. Revenue Streams

The strength on revenue streams elements at this time is there are multiple payment option from each transaction of the house and gain profit from those each transaction. The weakness of the revenue stream is only happen at once of each customer. The opportunity that can be expanded is related to revenue stream is by adding more projects and sites. Threats of the revenue stream is there are deferment of each house related legality related to the process.

f. Key Resources

The strength of key resources is there are available elements to build and promote the house and has human resource who are capable by a good attitude. The weakness of the key resources are there still not yet able to fulfill the needs of customer. The opportunity from the key resources is applying a good human resources management to optimize other resources that is owned. The threat of key resources at this time is competitor is better to manage the key resources.

g. Key Activities

The strength of key activities at this time is it able to find new strategic area and has lower buying value but with higher selling value. The weakness of the key activities at this time is still not yet able to do the area expansion aggressively because of it needs many consideration from each point of view. The opportunity that can be reached is by keep fixing the field management and adding some connections between developers. The threats of key activities is competitor can be easily duplicate the key activities PT Hasta Raya Utama.

h. Key Partnership

The strength of key partnership at this time is PT Hasta Raya Utama is well-known by partner so that many partner still needs a continuative partnership, besides that material supplier also providing a raw material of PT Hasta Raya Utama on time. The weakness of the key partnership that is not yet maximized is the total partner that can cooperate well so that the material cost become relatively cheaper. The opportunity that can be gained is finding potential partner as much as possible so that company can do the material cost comparison. The threat of the key partnership is the dependency of the company to same partners.

i. Cost Structure

The strength of the cost structure element is the cost for legality can be pushed because PT Hasta Raya utama do the process in one package and one entrance in which through the same notary that is appointed by the management. The weakness of this element is the unstable operational cost and the time-length management that needs more enough spare time in order to ensure the legality meet the owner. The opportunity of cost structure is by utilizing the partners in order to reduce the time-length but doesn't mean reducing the cost. The threat about cost structure is the material cost can be gradually increasing because of government regulation.

The Making and Choosing of Alternative Prototype Business Model

The making of alternative business model is using
ideation methods / generation idea by emerging several idea in order to gain the best one. The in the alternative selection it is adjusted by vision, mission, and company condition. In case of making this alternative prototype business model, the alternative that is developed for PT Hasta Raya Utama is prototype alternative business model with the focusing concept on customer segmentation, in which good institution from government or private.

**Suggestion of Business Model Prototype PT Hasta Raya Utama**

This idea is using business concept that has purpose in resulting the income and broaden / expand the business with more focusing on the customer segmentation. Customer segmentation that will be implemented here is a cooperation with good institution whether government or private through the house-owned program for their staff. The channel used here is by joining some tender that is held by the institution.

By this business model prototype, the company expects that their customer will buy the house clearly and convincingly, so that the focus of the company will be more emphasized on the developing, legality process, and house permission. The concept of this prototype business model if written in nine business model canvas element is explained as in follow;

**a. Customer Segment**

In this element, the customer segment that want to be achieved is from the institutions' staff, both government or private that has house-owned program or that has facilitities to give a house for their staff.

**b. Value Proposition**

In this element, value that wants to be given same with the current business concept in which giving complete legality up ownership certification. But there is also a value addition such as payment system that is negotiable.

**c. Channels**

In this element, channels that is used is joining the tender, so that in this case PT Hasta Raya Utama need to have competent human resource to calculate the value of project.

**d. Customer Relationships**

In this element, the form of customer relationship is shown by the quality of house unit that is being built that PT Hasta Raya Utama has credibility to the customer.

**e. Revenue Streams**

In this element, the cashflow of the company is gained from the sales transaction of the projects. The value that is obtained from the project sales from mature-land sales value by means the land that has included of legality process, permission an public service providing (fence, road, waterways, and park)

**f. Key Resources**

In this element, resources that is used is intellectual resource, physical resource, and human resource. Company as an owner of the resource use their intellectual rights as its business consideration

**g. Key Activities**

In this element, activity that is done by the company is focusing on the innovation about home-design that is built customized with customer needs cooperatively. The further key activities is networking, by doing networking as much as possible it is expected that company will be able to provide a chance to gain the information about tender that is done by an institution.

**h. Key Partnerships**

Key partnership is cooperative partner in property sector that has a role in operating the organization. At this time by the limitation of the resources, the company keep coaching and maintaining good relationship between their partner. The current partner of PT Hasta Raya Utama is: Bank, Notary, BPN, Local Government Office, material supplier, and key person of the institution.

**i. Cost Structure**

The cost structure that is needed such as other cost for entertaining certain key person in a institution, including to run the network-expansion activities.
From the result from the making of alternative business model prototype, thus, it will be done the selection of business model that has already suggested. The selection criteria is based on the vision, mission, and company condition.

In this suggested prototype in which institution business concept, it is SESUAI with company mission in accelerating the way how the project needs to be run and the company cash flow. Once PT Hasta Raya Utama do the partnership with an institution then the payment system that will be gained is generally gradual and should have the early equity that is big enough. This equity is used to take over the land that will be functioned as a residence. The payment that is done by the institution is generally happened when the land has ready to be built, which means to reach that ready land, the process that is done by the company is permission process, and also land clearing. During the stages is done by group of developer it should has a big equity.

IV. CONCLUSION

PT Hasta Raya Utama is a company that run its business in property sector with the main product is cluster. By the business model canvas, thus, the business elements model of PT Hasta Raya Utama can be identified clearly. From the identification result we can see that even the offered product in is a specific residence, but by the business concept, PT Hasta Raya Utama has not still implement the comprehensive business model. It is caused by aimed customer segment that has not specified. Besides that, marketing channel is also unspecific by targeting random customer depend on the PT Hasta Raya Utama target.

As a suggestion to refine previous business model, thus there should be an alternative business model prototype that is customer segmentation both in government or private. This concept is mainly focusing on the acceleration of the process of a project and the assurance of the company cash flow.

To support this business model prototype thus one of the key activities will be play an important role in the networking expansion optimally. The prototype is chosen in order the revenue stream of PT Hasta Raya Utama is not influenced by the micro economy condition.

V. BIBLIOGRAPHY

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Lean Project Management – Innovative Strategies in the Automotive Industry

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Abstract - In the past, many experts have made studies on how innovative strategies have been used for effective and efficient execution of new product development (NPD) projects in industries. These strategies aim at effectively leveraging the strength of the organization. Leading manufacturers in the automotive industry periodically develop new products in the existing platform to enhance customer satisfaction and develop new platforms to meet future requirements. It is evident that each project in a firm has linkages with the past projects through shared technology and resources. As a result, technology and resource management is very important for a firm to move towards lean project management. This paper aims at discussing innovative strategies used in Indian automotive industry and their applicability in NPD. This paper also discusses on the importance of innovative project management which every organization is now developing to create a safe and robust products to add value to customer, launch products with reduced time to market, encourage concurrent engineering practices and continuously enhance competitiveness in terms of investment, time, and quality. It is also imperative that to achieve these objectives, products have to be developed with a spirit of total quality management with involvement of every employee of the organization by meeting the production requirements through optimized product/process design and also by integrating the suppliers to develop and control the quality of outsourced components and products. In this paper, types of project management governance bodies are discussed. The industry is steering towards excellence in project management for swift delivery of new products. The governance body assesses the quality of product development process at two levels. At first level, the quality manager assesses technical issues in the product and suggests suitable measures to close them. In next level, the divisional manager assesses the actuals against the financial and delivery targets. If the above said parameters are satisfied, the project is allowed to go ahead to the subsequent phase. When a project is opened by the high level management, it is mandatory to employ resources to execute the project and this is called the Project Team. The project team comprises of a project manager, project team members from R&D, supply chain, process planning, purchase, quality, marketing, launch manager and safety manager. The project team is also associated with the contributors or functional experts from each of the functions. In this paper various project organizations in automotive industry are discussed in detail. This paper as a whole discusses on the product development strategies for an organization to be lean in new product development. This paper also focuses on Innovative project management which is a recent development in automotive industry and an aid to product development and design resulting in seamless launch of new products to market. Typology of projects and governance body to assess the product development process, Project management organization and its structure are presented. Finally an experimental design to prove the significant difference between the conventional and innovative project management process is presented.

Index Terms - NPD, Lean Project Management, New Platform, Governance Bodies

I. INTRODUCTION TO PROJECT MANAGEMENT

Project management is the discipline of planning, organizing, motivating, and controlling resources to achieve specific goals. A project is a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end undertaken to meet unique goals and objectives, typically to bring about beneficial change or added value. The temporary nature of projects stands in contrast with business as usual, which are repetitive, permanent, or semi-permanent functional activities to produce products or services. In practice, the management of these two systems is often quite different, and as such requires the development of distinct technical skills and management strategies. The primary challenge of project management is to achieve all of the project goals and objectives while honoring the preconceived constraints. The primary constraints are scope, time, quality and budget. The secondary —and more ambitious— challenge is to optimize the allocation of necessary inputs and integrate them to meet pre-defined objectives.

1.1 Lean Project Management

Lean project management is the comprehensive adoption of other lean concepts like lean construction, lean manufacturing and lean thinking into a project management context. Lean project management has many ideas in common with other lean concepts; however, the main principle of lean project management is delivering more value with less waste in a project context. Lean project management has many techniques that can be applied to projects and one of main methods is standardization. Key techniques adapted for this paper are reduction of rework, overproduction and over processing, which are wastes leading to delay in projects and suboptimal deliverables.

1.1.1 Innovative Principles in Lean Project Management

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As innovation is crucially important for business growth in automobile industries, it is essential to establish Innovation in Project Management as a core competency. Principles of innovation management include, Customer requirement and regulations, decision making bodies and rules, organization for project management, development process, functional excellence, portfolio and resource management.

**Fig. 1: House of Innovative Project Management**

### II. LITERATURE REVIEW

**Mats and Anna (2003)**, explores the nature of organizational settings, where a large extent of the operations is organized as simultaneous or successive projects which is a stream of lean project management. Anchored in qualitative case studies, they analyzed why the resource allocation syndrome is the number one issue for multi-project management and discussed the underlying mechanisms behind this phenomenon.

**Dragan and Peerasit (2004)**, explores the concept of Standardized Project Management in the Companies which frequently opt to implement standardized project management (SPM), which can be defined as a standardized set of project management practices. These companies expect that such an approach will carry significant potential for improving project performance. To investigate this potential, the authors undertook an exploratory study into the impact of SPM on project performance in development projects in high-velocity industries. They developed hypotheses based on these factors and performed hypothesis testing to identify factors that impact project success.

**Lynn et al. (2006)** in their paper undercovers the project management trends over the last 10 years. The field of project management continues to develop in response to changing emphases in the management community and the demands of new project management application areas. This paper uncovers the trends of emphasis within the project management literature over the period 1994–2003, by analyzing articles in the International Journal of Project Management and the Project Management Journal. Trends identified in this study are then compared to trends of emphasis identified in a variety of previous studies of changes to the field. These results are then synthesized to provide an overall impression of how the field is changing.

**Liz and Tim (2007)**, has done qualitative study which examines whether virtual projects present challenges that are different from conventional projects and how they might be more useful than face-to-face teams in delivering value in certain contexts. It takes a post-implementation and lessons learned approach to elicit the experiences of two distributed information technology projects within a global banking corporation. Findings indicate that time zone and cultural differences in particular, affected communication and team relations. Other barriers included more ‘conventional’ issues such as management agenda and leadership style, requirements creep, asymmetry in processes and unclear roles and responsibilities. The study concludes that virtual teams are useful for projects requiring cross-functional or cross-boundary skilled inputs and the key to their value creation is to have a defined strategy to overcome problems associated with at-distance cooperation.

**Liviu et al. (2010)**, discusses that project management has evolved over time, becoming the principal mean of dealing with change in modern organizations. Best practices have occurred as a result of business evolution and of practicing project management at a global level. Best practices in project management, if followed, increase the chances of success in achieving goals when dealing with projects. The authors present the concept of best practice, the advantages of using best practices in project management, which are the best practices used today and also a comparison between two of the mostly used best practices methodologies in project management, Project Management Body of Knowledge and Project Cycle Management Guidelines.

**Ifeolua and Yinshang (2010)**, discusses that effective management of projects is increasingly becoming important for organizations to remain competitive in today’s dynamic business environment. The use of benchmarking is widening as a method to support project management. Benchmarking is the search of best practices that will lead to superior performance in some business activity. Benchmarking has been recognized as one of the most responsive evaluation tools for performance improvement within organizations by creating a culture of continuous improvement from learning best management practices. This paper presents how benchmarking principles can be applied to improve project management process and performance.

**Azharul Karim and Savitz Nekoufar (2011)**, in their paper stated that, Lean project management is the comprehensive adaption of other lean concepts like lean construction, lean manufacturing, and lean thinking into project management context. Execution of many similar industrial projects creates the idea of lean project management in companies and rapidly growing in industries. The authors offer a standardization method in order to achieve Lean project management in Infrastructure and other large scale industrial projects. Standardization refers to all activity which makes two projects most identical and unify to each other. Although standard project may have minor efficiency decrease, compare to custom built project; but great advantage of standard project like cost saving, time reduction and quality improvement justify standardization Methodology.

### III. INTRODUCTION TO NEW PRODUCT DEVELOPMENT

In business and engineering, new product development (NPD) is the complete process of bringing a new product to market. A product is a set of benefits offered for exchange and can be tangible (that is, something physical you can touch) or intangible (like a service, experience, or belief). There are two parallel paths involved in the NPD process: one involves the idea generation, product design and detail

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Two specific committees
  o Project Quality Committee, to make technical decisions
  o Business Management Committee to make business decisions

Design Reviews must verify design implementation, including product and process feasibility, with the Suppliers. It must be organized by Purchasing member conducted by the R&D member, with Quality member and SQA Contributors and all relevant actors.

1.3.1 Project Quality Committee

The Project quality committee is chaired by the company quality president and provides Business management committee with technical decisions which contribute to:

• Ensure quality of technical deliverables
• Manage critical impacts on customer milestones (and identify critical major impacts on budget)
• Validate and assess risks involved in project and availability of reaction plan

Fig. 3: Project Quality Committee Structure

1.3.2 Business Management Committee

The Business Management Committeis chaired company managing director and makes business decisions in order to ensure:

• Customer satisfaction
• Flawless launch to market
• Project Profitability

Responsibilities of Business Management Committee are,

• Open new projects, analyze and approve new projects, nominate Project Teams and set objectives to the project teams
• Conduct project gateviews
• Decide and suggest directions on critical issues raised by Project Teams
• Re-work or close a project if required
• Managing project portfolio
Anticipate, validate and arbitrate resources assignment
Manage transversal improvement action plans

![Diagram of Business Management Committee Structure](image)

**Fig. 4: Business Management Committee Structure**

1.4 Project Management Organization
In the past, many organizations adopted functional organization structure for the delivery of the product. This structure was not successfull in the long run as it had complexities in managing the project. The focus towards project activities were impacted and more importance was given to functional activities. This lead to slow down of meeting the timelines and delivery of product in the market.

To overcome this, in the recent past many automotive organizations started to migrate from functional type of organization to pure project management organization structure in order to adhere to the timely delivery of products to the market. In the pure project management structure, the project members wereempowered by their functions to manage their respective contributors assigned by their department manager. They are responsible for the detailed scheduling and budgeting of their work, as well as for performing their activities following function procedures and efficiency plan.

This section further displays the various project management organizational structures.

![Diagram of Project Organization in Tier 1 Automotive Concern](image)

**Fig. 5: Project Organization in Tier 1 Automotive Concern**

![Diagram of Project Organization in Farm Trac Concern](image)

**Fig. 6: Project Organization in Farm Trac Concern**

![Diagram of Project Organization in Commercial Vehicle Concern](image)

**Fig. 7: Project Organization in Commercial Vehicle Concern**

1.4.1 Roles and Responsibilities in Project Organization

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The **Program Director** is accountable for the performance of his portfolio of projects, more specifically:

- Manages the project portfolio: list of projects, budget & resource management
- Ensures Projects flawless launches: validates risk in the project
- Escalates critical project issues to business management committee
- Meets the Financial objectives (Gross Margin, Development costs, Investments)
- Is the role model: on project management processes by developing and enforcing the use of standard methodologies, tools, organizations, indicators, performing audits and animating the project efficiency plan
- Develops Project Management functions (competencies, career paths, training...)

The **Project Manager** is accountable for the performance of his project, more specifically:

- Reaches the project QCD objectives as specified in the budget
- Manages his Project Team and processes in compliance with corporate rules:
  - Project risk,
  - Project schedules & deliverables for customer satisfaction
  - Product gross margin (cost and price), investments
  - Budget and follow-up of project cost
  - Project Team appraisals
- Ensures that the activities required to achieve safety objectives are performed and if needed that compliance with safety standard is achieved. The Project Manager presents the project at Quality management and business management reviews.

The **Function Manager** is accountable for his deliverables to the project, more specifically:

- Assigns adequate project members and contributors to comply with projects deliverables and milestones
- Follows closely the proper execution of the activities and organizes regularly formal reviews
- Validate all the action plans to solve issues of critical Projects
- Ensures content of functional excellence
- Controls and respects budgets allocated to their function/meter for all projects in his perimeter
- Brings an additional support when needed (it can be with internal resources, pooled resources,…) 
- Ensures that project members and contributors have the relevant level of competences

The Function Manager is the hierarchical manager of the Project Team Members and the Contributors.

1.5 Development Process

The core of development process is in the creation and central management of all product data and the technology used to access this information and knowledge. PLM as a discipline emerged from tools such as CAD, CAM and PDM, but can be viewed as the integration of these tools with methods, people and the processes through all stages of a product’s life. It is not just about software technology but is also a business strategy.

For simplicity the stages described are shown in a traditional sequential engineering workflow. The exact order of event and tasks will vary according to the product and industry in question but the main processes are:

- Conceive
  - Specification
  - Concept design
- Design
  - Detailed design
  - Validation and analysis (simulation)
  - Tool design
- Realize
  - Plan manufacturing
  - Manufacture
  - Build/Assemble
  - Test (quality check)
- Service
  - Sell and deliver
  - Use
  - Maintain and support
  - Dispose

![Fig.8: Development Process](image-url)

**Phase 1: Conceive**

*Imagine, specify, plan, innovate*

The first stage is the definition of the product requirements based on customer, company, market and regulatory bodies’ viewpoints. From this specification, the product's major technical parameters can be defined. In parallel, the initial concept design...
work is performed defining the aesthetics of the product together with its main functional aspects. Many different media are used for these processes, from pencil and paper to clay models to 3D CAID computer-aided industrial design software.

In some concepts, the investment of resources into research or analysis-of-options may be included in the conception phase – e.g. bringing the technology to a level of maturity sufficient to move to the next phase. However, life-cycle engineering is iterative. It is always possible that something doesn't work well in any phase enough to back up into a prior phase – perhaps all the way back to conception or research. There are many examples to draw from.

**Phase 2: Design**

Describe, define, develop, test, analyze and validate

This is where the detailed design and development of the product’s form starts, progressing to prototype testing, through pilot release to full product launch. It can also involve redesign and ramp for improvement to existing products as well as planned obsolescence. The main tool used for design and development is CAD. This can be simple 2D drawing/drafting or 3D parametric feature based solid/surface modeling. Such software includes technology such as Hybrid Modeling, Reverse Engineering, KBE (knowledge-based engineering), NDT (Nondestructive testing), Assembly construction.

This step covers many engineering disciplines including: mechanical, electrical, electronic, software (embedded), and domain-specific, such as architectural, aerospace, automotive, ... Along with the actual creation of geometry there is the analysis of the components and product assemblies. Simulation, validation and optimization tasks are carried out using CAE (computer-aided engineering) software either integrated in the CAD package or stand-alone. These are used to perform tasks such as: Stress analysis, FEA (finite element analysis); kinematics; computational fluid dynamics (CFD); and mechanical event simulation (MES). CAQ (computer-aided quality) is used for tasks such as Dimensional tolerance (engineering) analysis. Another task performed at this stage is the sourcing of bought out components, possibly with the aid of procurement systems.

**Phase 3: Realize**

Manufacture, make, build, procure, produce, sell and deliver

Once the design of the product’s components is complete the method of manufacturing is defined. This includes CAD tasks such as tool design; creation of CNC Machining instructions for the product’s parts as well as tools to manufacture those parts, using integrated or separate CAM computer-aided manufacturing software. This will also involve analysis tools for process simulation for operations such as casting, molding, and die press forming. Once the manufacturing method has been identified CPM comes into play. This involves CAPE (computer-aided production engineering) or CAP/CAPP – (production planning) tools for carrying out factory, plant and facility layout and production simulation. For example: press-line simulation; and industrial ergonomics; as well as tool selection management. Once components are manufactured their geometrical form and size can be checked against the original CAD data with the use of computer-aided inspection equipment and software. Parallel to the engineering tasks, sales product configuration and marketing documentation work take place. This could include transferring engineering data (geometry and part list data) to a web based sales configurator and other desktop publishing systems.

**Phase 4: Service**

Use, operate, maintain, support, sustain, phase-out, retire, recycle and disposal

The final phase of the lifecycle involves managing of in service information. Providing customers and service engineers with support information for repair and maintenance, as well as waste management/recycling information. This involves using tools such as Maintenance, Repair and Operations Management (MRO) software.

There is an end-of-life to every product. Whether it be disposal or destruction of material objects or information, this needs to be considered since it may not be free from ramifications. From the above product development phases, it is evident that the systematic product development phases mapping to project management results in better efficiency in terms of project delivery time (reduced development time and availability of product at the right time to the market).

1.6 Functional Excellence

Functional Excellence is the ability of one functional network to perform outstandingly the necessary tasks for projects.

Functional Excellence is based on:

- Excellence in functional skills, competences and methodology
- Excellence in functional tool selection and enhancement
- Excellence in functional organization
- Excellence in standardization of all functional areas of know-how through the deployment and through Transverse Focus Groups

4.5.1 Key Factors to Functional Excellence

Standardization and Capitalization are key factors to functional excellence. They form the procedure to ensure robust Product/process files through the development of Product/process standards.

Functional Excellence enables to -

- Ensure product robustness and safety
- Reduce development costs of new products
- Reduce risks and re-work in new projects
- Reduce Time to Market
- Ensure that lessons from previous issues are gathered, which will benefit to current and future products

1.7 Quality Assurance

In this section, the importance of quality assurance linked with Project Management is discussed. In the historic period, the
quality management process was delinked from the mainstream product development activities. Quality department was always involved after the product development conclusion.

This scenario gradually changed and the induct of quality department has been a part of product development process and linked in the project management process.

The Project Quality is part of the development process that ensures development with discipline and rigor

In many organizations, Total Quality depends on:

- Organization and decision making, development process
- Involvement of Personnel
- Supplier Integration during product development
- Production System

Through project development processes, the target of Project Quality is to provide products/systems/modules that meet customers “explicit and implicit” expectations and applicable regulatory requirements such as:

- Usefulness
- Fit for use
- Fit social requirements
- Competitive strength and reliability
- Ability to be produced with a lean and capable process

Project Quality must also ensure flawless launches and zero issue during production lifetime by controlling strict application of Built-In-Quality

4.7 Portfolio and Resource Management

Portfolio Management is the process for selecting the right projects in order to achieve a strategic mix of technologies, timeframe, risk, markets and business segments. Resource Management is the process for anticipating Development Staff needs, in terms of quantity, skills and timing, with pertinent “granularity”.

V. DIFFERENCES IN INNOVATIVE PROJECT MANAGEMENT PROCESS AND CONVENTIONAL PROCESS

In the previous sections, the advancements in the project management process were discussed. In this section, the differences between innovative project management process and conventional process is discussed with help of an experimental analysis.

1.8 Experimental investigation of project delivery times

The objective is to test whether there is significant difference between the companies in terms of project delivery time. Hence, a complete factorial experiment with two factors, viz. Company (A) and Project Management Process (B) is designed with ten replications under each of the experimental combinations.

The data of this experiment are shown in Table 1. The number of levels for the Factor A is 3, viz. Company 1, Company 2 and Company 3. The number of levels for the Factor B is 2, viz. Innovative and Conventional.

The ANOVA model of this experiment is as presented below.

\[ Y_{ijk} = \mu + A_i + B_j + A_B_{ij} + e_{ijk} \]

where,

- \( \mu \) is the over all mean of delivery times.
- \( Y_{ijk} \) is the kth replication of the ith company and jth project management process in terms of delivery time
- \( A_i \) is the effect of the ith company on the response in terms of project delivery time.
- \( B_j \) is the effect of the jth project management process on the response in terms of project delivery time.
- \( AB_{ij} \) is the effect of the ith company and jth project management process on the response in terms of project delivery time.
- \( e_{ijk} \) is the error associated with the kth replication under the ith company and jth project management process

<table>
<thead>
<tr>
<th>Company</th>
<th>Innovative</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
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<tr>
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<td>3</td>
</tr>
</tbody>
</table>

Table 1: Data of delivery times of projects

- \( B_j \) is the effect of the jth project management process on the response in terms of project delivery time.
- \( AB_{ij} \) is the effect of the ith company and jth project management process on the response in terms of project delivery time.
- \( e_{ijk} \) is the error associated with the kth replication under the ith company and jth project management process

The hypotheses relating to this experiment are listed below.
Hypotheses w.r.t. Factor A (Company)

\( H_0 \): There is no significant difference between the means of the companies in terms of project delivery time.

\( H_1 \): There is significant difference between the means of the companies in terms of project delivery time.

Hypotheses w.r.t. Factor B (Project Management Process)

\( H_0 \): There is no significant difference between the means of the project management process in terms of project delivery time.

\( H_1 \): There is significant difference between the means of the project management process in terms of project delivery time.

Hypotheses w.r.t. Interaction Terms of Factor A and factor B (Company x Project management process)

\( H_0 \): There is no significant difference between the means of the interaction of company and project management process in terms of project delivery time.

\( H_1 \): There is significant difference between the means of the interaction of company and project management process in terms of project delivery time.

The results of ANOVA of the data given in Table 1 are given in Table 2.

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>Degrees of Freedom</th>
<th>Mean Square of Squares</th>
<th>F-Ratio</th>
<th>P-value</th>
<th>Inference</th>
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</tbody>
</table>

Table 2: Results of ANOVA

Factor A (Company)

There is significant difference between the companies in terms of project delivery time.

Factor B (Project Management Process)

There is significant difference between the project management process in terms of project delivery time.

Factor A X Factor B

There is significant difference between the interaction terms of Company and Project Management Process.

So in the next stage, the significance of the difference between each pair of mean delivery times of the projects is analyzed using Duncan Multiple range test.

There is significant difference between the treatments of the Factor B (project management process). Further, the mean project delivery time for the innovative project management process (3.42) is less than that (4.02) of conventional project management process. Based on these facts, it is clear that the innovative project management process has the least project delivery time.

5.1.1 Duncan’s Multiple Range Test

As per the steps of Duncan’s multiple range test the necessary results are presented below.

The Standard Error of each treatment is 0.02188. The significant ranges obtained from the Duncan’s table of multiple ranges for \( j = 3 \) and error degrees of freedom of 54 are given in Table 3.

Table 3. Significant Ranges from Duncan’s Table

<table>
<thead>
<tr>
<th>Significant Range</th>
<th>Range 1</th>
<th>Range 2</th>
</tr>
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<tbody>
<tr>
<td>Value</td>
<td>2.990</td>
<td>3.778</td>
</tr>
</tbody>
</table>

Table 4: Least Significant Ranges

The summary of the differences between the means of the project delivery times of the 3 projects and the corresponding values of the least significant ranges are shown in Table 4.

Table 4: Least Significant Ranges

<table>
<thead>
<tr>
<th>Least Significant Value (LSR)</th>
<th>Range 1</th>
<th>Range 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value</td>
<td>0.0826</td>
<td>0.0936</td>
</tr>
</tbody>
</table>

From Fig 9, it is clear that the actual difference between each pair of projects is more than the respective least significant range.

Hence, the inferences based on this figure are as listed.

The mean delivery time of the company 3 is significantly different from that of the company 2 as well as that of the Company 1. Further, the mean delivery time of the company 1 is significantly different from that of the company 2.

Hence, the company 3 is the best in terms of least project delivery time.
VI. CONCLUSION

In this paper the efficient and effective way of New Product development process with involvement of lean project management is discussed. Considerable literature review is conducted to have a feel on the lean and agile project management methodologies. Innovative strategies like house of innovative project management is discussed. Also the modern phases of development process is discussed in detail. In this modern world, product development process goes synchronous with quality assurance from the kick-off the project and thus total quality management is discussed in brief.

The innovative project management processes are comparable with Lean Manufacturing practices. Project quality and Management committee ensures that there are minimum rework. Program Manager plans the work to avoid overprocessing and Design reviews help in reducing overdesign. Finally the project structure enables everyone to contribute to reach target in time. The Managing Director acts as a Lean Champion leading all causes.

To make this paper more concrete and to publish that there is difference between conventional process and innovative project management process, an experimental design is conducted using a complete factorial experiment with two factors, viz. Company (A) and Project Management Process (B) is designed with ten replications under each of the experimental combinations.

It is evident from the results that there is significant difference between the companies in terms of project delivery time w.r.t conventional and innovative process. In order to prove the best company with reduced project delivery time, Duncan’s table is used and it is concluded that company 3 is the best interns of project delivery time with innovative project management process.

From the results obtained through the experimental investigation and from the source of literature review it is evident that Lean Project Management plays a vital role in New Product Development for optimized delivery timelines.

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Website:


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Palestinian Nurses’ Knowledge and Attitudes Regarding Pain Management

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Abstract- The under-treatment of pain is the most disturbing and annoying symptom for hospitalized patients worldwide, yet it is poorly assessed and managed. Pain undermines a person’s quality of life and negatively affects their physical, emotional and spiritual wellbeing. Nurses have a vital role in implementing pain management effectively; therefore inadequate knowledge remains a major barrier to achieving effective pain management. This study aims to assess knowledge levels and attitudes regarding pain management among nurses working in hospitals in south of Palestine. A quantitative cross-sectional study design was utilized to recruit a proportionate sample of 380 staff nurses working in different wards in six governmental and private hospitals in Palestine. A modified Arabic version of Nurses’ Knowledge and Attitude Survey questionnaire regarding Pain was used to answer the research questions. The results of the study showed that a mean score of knowledge was 15.5 out of 34 (45.6% out of 100%). This finding indicates that staff nurses had deficit in knowledge and negative attitudes toward pain assessment and management. The findings showed no significant difference in the mean score of knowledge in relation with gender (p = 0.181), age-group (p = 0.399), level of education (p = 0.934), and previous training courses or workshops on pain management (p = 0.612), except for the place of work (p <0.001). The results of this study indicate that there are serious challenges to adequate pain management. Curricular evaluation and/or change aiming to promote pain management and correcting the ingrained misconceptions are needed.

Keywords: Knowledge, Attitudes, Pain management, Nurses, Palestinian

I. INTRODUCTION

Insufficient pain management continues to be problematic for hospitalized patients and public health issue worldwide (Al-Shaer et al., 2011; Wysong, 2012). Pain is part of the human experience, as most people will experience it in their lifetime to varying degrees, for various durations, due to different etiologies (Matthews & Malcolm, 2007; Wood, 2002). In clinical settings nurses play a vital role in pain assessment and management, and must be knowledgeable regarding how to best assess and manage pain. Pain may be undertreated as a result of inadequate assessment or the inappropriate use of analgesics, especially opioids (Al-Shaer, Hill, & Anderson, 2011). Although research that has increased the awareness of pain management and has broadened knowledge of effective methods to assess and manage pain, nurses have not adequately used this knowledge to improve the care of patients experiencing pain and many patients still suffer from unnecessary discomfort (Vallano et al. 2006).

Literature reviews have indicated that there is an overall problem with nursing knowledge and attitudes towards pain management. Many nurses lack the education and training for effectively managing pain, resulting in longer hospital stays and reducing the quality of life for patients. Despite guidelines and pharmacologic interventions exist to manage pain, poor assessment and under-medication is well documented globally (Breivik et al., 2009). In addition, the barriers to pain management are numerous and can be related to patients, family caregivers, and health care providers and the care they provide.

Unfortunately, several research studies indicated that nurses have a knowledge deficit regarding pain, and may hold negative attitudes and misconceptions towards (Abdalrahim et al., 2011; Siedlecki et al., 2013). Moreover, many nurses have insufficient knowledge about basic mechanisms of action of medications, dosages and uses of certain pharmaceuticals, in addition to other pain management interventions (Lasch et al., 2002). While pain assessment and management is taught as part of the curricula of many nursing programs, it is often not enough in terms of time allotted and depth of academic inquiry to be effective (Abdalrahim et al., 2011; Siedlecki et al., 2013).
The consequences of unrelieved pain can be devastating. Its debilitating effects has significantly interferes with the patient’s physical, emotional and spiritual well-being, thus can alter the patient’s quality of life (Yava et al., 2013; Alexandrina and Jacinta, 2013). Acute pain that is poorly controlled can contribute to complications such as direct medical costs and substantial indirect costs due to days lost from work. When pain is inadequately managed, patients continue to suffer and seek treatment, therefore driving up healthcare expenditures that could have been avoided with proper management (Wells et al., 2008). Research suggests pain negatively affects the endocrine and metabolic system, cardiovascular system, gastrointestinal system, and immune system and is often responsible for stress (Wells et al., 2008). In addition, there is an assumption that pain is highly associated with emotional and physical functioning, and that a reduction in pain will inevitably lead to an improvement in function and patient satisfaction (Turk & Dworkin, 2004).

Several research studies have been conducted to examine health care professionals’ knowledge in managing patients’ pain. For example, a study was conducted in the United States to examine the attitudes regarding pain of nurses working in 10 separate nursing units in a mid western hospital and to assess their knowledge level (Al-Shaer et al., 2011). One hundred twenty-nine nurses completed the Nurses’ Knowledge and Attitudes Survey Regarding Pain (KASRP). It was found that nurses continue to demonstrate inadequate knowledge of pain assessment and pain management interventions. Another study to evaluate nurses’ knowledge of pain among 72 nurses who were either hospice or district nurses in the UK found that nurses had a low level of pain knowledge, with relatively special nurses having better knowledge in managing pain (Wilson, 2007).

In Palestine, there are no studies that examined Palestinian nurses’ knowledge and attitudes regarding pain management. To improve both the quality of care and the quality of life of patients suffering from medical illnesses, we need to assess the current knowledge and attitudes of registered nurses towards pain management. The purpose of this study therefore was to assess the current knowledge and attitudes of registered nurses towards pain management. This line of inquiry is critical because absence of pain is part of the basic human rights to health. Findings from this study add important information to the body of literature regarding nurses’ knowledge and attitudes towards pain management in south west-bank, Palestine and programs can be planned and interventions developed to advance the body of general nursing knowledge and the nursing specialty of pain management.

II. METHODOLOGY

Design and sample

A quantitative research method and a descriptive, cross-sectional study design were used. Data were collected from 6 settings (government and private hospitals) that represent the healthcare sector in south of West-Bank in Palestine. The target population was all nurses working in the critical care, emergency department, medical-surgical; oncology, pediatric, renal, and surgical services and who met the sample criteria and agreed to participate in the study. The inclusion criteria were: (i) nurses working with adult inpatients in all units in the participating hospitals; (ii) having worked in the hospital units for at least six months continuously. A sample of 380 consenting registered nurses was drawn using a stratified random sampling method. The response rate was 94.7%. The self-administrated survey consisted of two parts: (i) participants information form and (ii) the nurses’ knowledge and attitudes survey regarding pain-Arabic version (NKASRP-A).

The Nurses Knowledge and Attitude questionnaire Regarding Pain (KASRP) was used to measure the nurses’ level of knowledge and their attitude toward SCD pain assessment and management. The original NKASRP was developed by Ferrell and McCaffery in 1987 and was revised and updated in 2006 and 2008. This survey of 38 questions has been widely used in western countries. The first 21 items are true/false questions, items 22-36 are multiple choice questions, and items 37 and 38 are case studies. It includes aspects of pain assessment, pharmacological and non-pharmacological interventions and attitudes towards pain management (Ferrell & McCaffery 2006). Content validity of the KASRP was obtained by pain experts and derived from current standards of pain management. The construct validity was established through the comparison of scores from nurses across various levels of expertise. Test-retest reliability was estimated at \( r > .80 \). The items were
determined to reflect both attitudes and knowledge with an overall coefficient alpha of 0.85 (Ferrell & McCaffrey, 2008).

**Ethical Considerations**

Ethical approval for the study was obtained from Al Quds University and then from the Ethics Committees of the Palestinian Ministry of Health, as well as, from each hospital. Nurses’ privacy was protected by allowing for anonymous and voluntary participation. The purpose of the study was explained to the participants and consent was obtained prior to the data collection. In addition, participation in the study was voluntary, and the participants had the right to withdraw at any stage of the research. Furthermore, the identities of the participants were not disclosed, and only aggregate data were reported.

**Data analysis**

Data from the KASRP were analyzed using SPSS version 23.0 software. Descriptive statistics, including frequency, percentage, mean and standard deviation were used to describe the demographic data. The percentage of correct and incorrect answers for each item was calculated. Independent sample \( t \) test, one way ANOVA tests were used to detect differences in mean total score of knowledge in relation to demographic and personal characteristics. A p-value of <0.05 was considered statistically significant.

**III. Results**

**Sample Characteristics**

A total of 360 nurses completed and returned the study questionnaire. As shown in Table 1, 54.4% of the participants were male, and the average age was 27.7(SD 5.3) years. In addition, more than half of the nurses had a bachelor’s degree (59.4%) and were working in medical and surgical wards. Furthermore, 66.1% of nurses had 1 to 5 years of experience.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. of respondents (n)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age-group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 20</td>
<td>257</td>
<td>71.4</td>
</tr>
<tr>
<td>Between 20 - 25</td>
<td>83</td>
<td>23.1</td>
</tr>
<tr>
<td>&gt;25</td>
<td>20</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>196</td>
<td>54.4</td>
</tr>
<tr>
<td>Female</td>
<td>164</td>
<td>45.6</td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>133</td>
<td>36.9</td>
</tr>
</tbody>
</table>
Nurses’ Knowledge and Attitudes Regarding Pain Management

For each item of the KASRP, the percentages of the correctly answered items in the questionnaire are calculated. Tables 2 present the data concerning the level of knowledge about pain assessment and management which was tested through True and False questions and multiple choice questions. The score ranged from 0 to 34 and the total was calculated using the number of correct answers which were then converted to percentage. The overall mean score of the level of knowledge was 15.5 out of 34 (45.6% out of 100%). The highest score for all questions was 66.6% and lowest score was 18.1%. The participants scored above the recommended score of 80% (McCaffery & Pasero, 1999) in 5 questions and these questions were examining knowledge about pharmacological interventions. They scored between 50% and 70% in six questions and below 50% in 21 questions. The findings revealed that nurses had very poor knowledge about pain assessment and management. For example with regard to True and False questions, only 68 (18.9%) of the 360 participants correctly identified that vital signs are not always reliable. One thirds (n = 121, 33.6%) considered Promethazine (Phenergan) as a reliable potentiates of opioid analgesics. The highest percentages of correct answers were for items 6, 15, 16, 21, and 22, which are about respiratory depression occurrence, spiritual beliefs, opioid addiction, and manifestations of physical dependence following discontinuation of opioid (80.6%, 80.3%, 81.7%, 80.3% and 84.7%, respectively). However, many items received an extremely low percentage of correct answers. For example, twenty-one items did not reach a 50% correct answer rate. Most of these incorrect answers were related to: a) misunderstanding of physical dependence and its manifestations; b) morphine dosing calculations; c) fear of addiction; and d) knowledge of pain medication uses and side effects. For example, only 18.9% knew the peak time of intravenous morphine and 5.3% for oral morphine (see table 3). The difference in the mean score was measured by independent sample $t$ test, one way ANOVA tests. Although the sample size is large and the number of participants in each group is equal, it is difficult to detect the significance. when the total score of the questionnaire was compared regarding nurses’ gender, age, educational level, and exposure to previous pain education, no significant differences were identified between those characteristics and the total knowledge and attitude score, except for the place of work (hospital), as shown in the results of the one way ANOVA, where the p value was <0.001(Table 4).

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Correct Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - 5</td>
<td>238</td>
</tr>
<tr>
<td>6 - 10</td>
<td>82</td>
</tr>
<tr>
<td>11 - 15</td>
<td>27</td>
</tr>
<tr>
<td>More than 15</td>
<td>13</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of training</th>
<th>Correct Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Mezan Hospital</td>
<td>71</td>
</tr>
<tr>
<td>Hebron government hospital</td>
<td>50</td>
</tr>
<tr>
<td>Al Hussein Gov. Hospital</td>
<td>62</td>
</tr>
<tr>
<td>Al Yamama</td>
<td>43</td>
</tr>
<tr>
<td>BASR</td>
<td>67</td>
</tr>
<tr>
<td>Al Ahli Hospital</td>
<td>62</td>
</tr>
</tbody>
</table>

Table 2: Correctly Answered Items in the Questionnaire (True/False questions)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Content</th>
<th>Correct Responses</th>
</tr>
</thead>
</table>
1. Vital signs are always reliable indicators of the intensity of a patient’s pain. (F) 68 18.9
2. Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (F) 177 49.2
3. Patients who can be distracted from pain usually do not have severe pain. (F) 109 30.3
4. Patients may sleep in spite of severe pain. (T) 139 38.6
5. Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (F) 96 26.7
6. Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (T) 290 80.6
7. Combining analgesics that work by different mechanisms (e.g., combining an opioid with an NSAID) may result in better pain control with fewer side effects than using a single analgesic agent. (T) 188 52.2
8. The usual duration of analgesia of 1–2 mg morphine IV is 4–5 hours. (F) 163 45.3
9. Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiates of opioid analgesics. (F) 121 33.6
10. Opioids should not be used in patients with a history of substance abuse. (F) 92 25.6
11. Morphine has a dose ceiling (i.e., a dose above which no greater pain relief can be obtained). (F) 85 23.6
12. Elderly patients cannot tolerate opioids for pain relief. (F) 209 58.1
13. Patients should be encouraged to endure as much pain as possible before using an opioid. (F) 71 19.7
14. Children less than 11 years old cannot reliably report pain, so nurses should rely solely on the parent’s assessment of the child’s pain intensity. (F) 113 31.4
15. Patients’ spiritual beliefs may lead them to think pain and suffering are necessary. (T) 294 81.7
16. After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient’s response. (T) 289 80.3
17. Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (F) 117 32.5
18. Vicodin (hydrocodone 5mg + acetaminophen 500 mg) PO is approximately equal to 5–10 mg of morphine PO. (T) 218 60.6
19. If the source of the patient’s pain is unknown, opioids should not be used during the pain evaluation period, because this could mask the ability to correctly diagnose the cause of pain. (F) 72 20.0
20. Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (F) 175 48.6
21. Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm. (T) 288 80.0
22. Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. (T) 305 84.7

Table 3 Correctly Answered Items in the Questionnaire (Multiple-choice questions)

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Content</th>
<th>Correct Responses</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vital signs are always reliable indicators of the intensity of a patient’s pain. (F)</td>
<td></td>
<td>68</td>
<td>18.9</td>
</tr>
<tr>
<td>2</td>
<td>Because their nervous system is underdeveloped, children under two years of age have decreased pain sensitivity and limited memory of painful experiences. (F)</td>
<td></td>
<td>177</td>
<td>49.2</td>
</tr>
<tr>
<td>3</td>
<td>Patients who can be distracted from pain usually do not have severe pain. (F)</td>
<td></td>
<td>109</td>
<td>30.3</td>
</tr>
<tr>
<td>4</td>
<td>Patients may sleep in spite of severe pain. (T)</td>
<td></td>
<td>139</td>
<td>38.6</td>
</tr>
<tr>
<td>5</td>
<td>Aspirin and other non-steroidal anti-inflammatory agents are NOT effective analgesics for painful bone metastases. (F)</td>
<td></td>
<td>96</td>
<td>26.7</td>
</tr>
<tr>
<td>6</td>
<td>Respiratory depression rarely occurs in patients who have been receiving stable doses of opioids over a period of months. (T)</td>
<td></td>
<td>290</td>
<td>80.6</td>
</tr>
<tr>
<td>7</td>
<td>Combining analgesics that work by different mechanisms (e.g., combining an opioid with an NSAID) may result in better pain control with fewer side effects than using a single analgesic agent. (T)</td>
<td></td>
<td>188</td>
<td>52.2</td>
</tr>
<tr>
<td>8</td>
<td>The usual duration of analgesia of 1–2 mg morphine IV is 4–5 hours. (F)</td>
<td></td>
<td>163</td>
<td>45.3</td>
</tr>
<tr>
<td>9</td>
<td>Research shows that promethazine (Phenergan) and hydroxyzine (Vistaril) are reliable potentiates of opioid analgesics. (F)</td>
<td></td>
<td>121</td>
<td>33.6</td>
</tr>
<tr>
<td>10</td>
<td>Opioids should not be used in patients with a history of substance abuse. (F)</td>
<td></td>
<td>92</td>
<td>25.6</td>
</tr>
<tr>
<td>11</td>
<td>Morphine has a dose ceiling (i.e., a dose above which no greater pain relief can be obtained). (F)</td>
<td></td>
<td>85</td>
<td>23.6</td>
</tr>
<tr>
<td>12</td>
<td>Elderly patients cannot tolerate opioids for pain relief. (F)</td>
<td></td>
<td>209</td>
<td>58.1</td>
</tr>
<tr>
<td>13</td>
<td>Patients should be encouraged to endure as much pain as possible before using an opioid. (F)</td>
<td></td>
<td>71</td>
<td>19.7</td>
</tr>
<tr>
<td>14</td>
<td>Children less than 11 years old cannot reliably report pain, so nurses should rely solely on the parent’s assessment of the child’s pain intensity. (F)</td>
<td></td>
<td>113</td>
<td>31.4</td>
</tr>
<tr>
<td>15</td>
<td>Patients’ spiritual beliefs may lead them to think pain and suffering are necessary. (T)</td>
<td></td>
<td>294</td>
<td>81.7</td>
</tr>
<tr>
<td>16</td>
<td>After an initial dose of opioid analgesic is given, subsequent doses should be adjusted in accordance with the individual patient’s response. (T)</td>
<td></td>
<td>289</td>
<td>80.3</td>
</tr>
<tr>
<td>17</td>
<td>Giving patients sterile water by injection (placebo) is a useful test to determine if the pain is real. (F)</td>
<td></td>
<td>117</td>
<td>32.5</td>
</tr>
<tr>
<td>18</td>
<td>Vicodin (hydrocodone 5mg + acetaminophen 500 mg) PO is approximately equal to 5–10 mg of morphine PO. (T)</td>
<td></td>
<td>218</td>
<td>60.6</td>
</tr>
<tr>
<td>19</td>
<td>If the source of the patient’s pain is unknown, opioids should not be used during the pain evaluation period, because this could mask the ability to correctly diagnose the cause of pain. (F)</td>
<td></td>
<td>72</td>
<td>20.0</td>
</tr>
<tr>
<td>20</td>
<td>Anticonvulsant drugs such as gabapentin (Neurontin) produce optimal pain relief after a single dose. (F)</td>
<td></td>
<td>175</td>
<td>48.6</td>
</tr>
<tr>
<td>21</td>
<td>Benzodiazepines are not effective pain relievers unless the pain is due to muscle spasm. (T)</td>
<td></td>
<td>288</td>
<td>80.0</td>
</tr>
<tr>
<td>22</td>
<td>Narcotic/opioid addiction is defined as a chronic neurobiological disease, characterized by behaviors that include one or more of the following: impaired control over drug use, compulsive use, continued use despite harm, and craving. (T)</td>
<td></td>
<td>305</td>
<td>84.7</td>
</tr>
</tbody>
</table>
23. The recommended route of administration of opioid analgesics for patients with persistent cancer-related pain is: **oral**

24. The recommended route administration of opioid analgesics for patients with brief severe pain of sudden onset, such as trauma or postoperative pain, is: **intravenous**

25. Which of the following analgesic medications is considered to be the drug of choice for the treatment of prolonged moderate to severe pain for cancer patients? **morphine**

26. Which of the following IV doses of morphine administered over a 4 hour period would be equivalent to 30 mg of oral morphine given q 4 hours? **morphine 10 mg IV**

27. Analgesics for postoperative pain should initially be given: **around the clock on fixed schedule**

28. A patient with persistent cancer pain has been receiving daily opioid analgesics for 2 months. Yesterday the patient was receiving 200 mg/h morphine intravenously. Today he has been receiving 250 mg/h intravenously. The likelihood of the patient developing clinically significant respiratory depression in the absence of new co-morbidity is: **less than 1%**

29. The most likely reason a patient with pain would request increased doses of pain medication is: **the patient is experiencing increased pain**

30. Which of the following is useful for treatment of cancer pain? **all of the above**

31. The most accurate judge of the intensity of the patient’s pain is: **the patient**

32. Which of the following describes the best approach for cultural considerations in caring for patients in pain? **patient should be individually assessed to determine cultural influence**

33. How likely is it that patient who develops pain already have an alcohol and/or drug abuse problem? **5%–15%**

34. The time to peak effect for morphine given orally is: **1–2 h**

### Table 4 Independent t Test Results Analyzing the Difference in Mean Total Nurse Knowledge Score Based on gender and previous training

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>t statistic (df)</th>
<th>95% CI of Difference</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n=196)</td>
<td>15.3 (2.9)</td>
<td>-1.34 (358)</td>
<td>(-0.98, 0.19)</td>
<td>0.181</td>
</tr>
<tr>
<td>Female (n=164)</td>
<td>15.7 (2.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Previous training</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (n=229)</td>
<td>15.3 (3.3)</td>
<td>-0.51 (358)</td>
<td>-1.31, 0.77</td>
<td>0.612</td>
</tr>
<tr>
<td>No (n=31)</td>
<td>15.5 (2.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 5 One Way ANOVA Test Results Analyzing the Difference in Mean Total Nurse Knowledge Score Based on Age, Level of Education and Place of work

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>F statistic (df)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age-group</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between 20-29 yrs (n=257)</td>
<td>15.4 (2.8)</td>
<td>0.92 (2)</td>
<td>0.399</td>
</tr>
<tr>
<td>Between 30-39 yrs (n=83)</td>
<td>15.9 (2.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others (n=20)</td>
<td>15.3 (2.3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma (n=133)</td>
<td>15.5 (2.7)</td>
<td>0.07</td>
<td>0.934</td>
</tr>
<tr>
<td>Bachelor (n=214)</td>
<td>15.5 (2.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Master (n=13)</td>
<td>15.3 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Place of work</strong></td>
<td></td>
<td>8.98 (5)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Al Mezan Hospital(n=76)</td>
<td>15.3 (2.9)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hebron government hospital(n=50)</td>
<td>14.8 (2.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al Hussein government Hospital(n=62)</td>
<td>16.3 (2.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al Yamama(n=43)</td>
<td>15.8 (2.1)</td>
<td></td>
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<td>BASR(n=67)</td>
<td>16.8 (3.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Al Ahli Hospital(n=62)</td>
<td>14.1 (2.5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IV. DISCUSSION

This is the first study conducted in Palestine to examine the level of knowledge and attitudes of nursing staff toward pain assessment and management. This study showed that the Palestinian nurses lacked the required knowledge and had misconceptions pain relief interventions. Findings in the mean scores of knowledge of pain and pain management suggests that there is a gap in the understanding of pharmacology related to pain management, as well as deficits in knowledge related to addiction and substance abuse. The minimum 80% score set by the authors of the KASRP was not met. Deficits in knowledge were particularly evident in the areas of analgesic dosing, analgesic ceiling of opioids, and discerning addiction from tolerance and physical dependence. In general, the results indicate that nurses in this study have a poor knowledge of pain assessment and management. This finding was consistent and similar to those obtained by Lui et al. and Tsai et al. The mean score obtained by Lui et al. was 47.72%, while Tsai et al. had an overall score of 49.2% (Lui et al., 2008; Tsai et al., 2007). Furthermore, the results of this study were lower compared to results of previous studies (Al Qadire and Al Khalaileh, 2014; Burns et al., 2010). For example, Al Qadire & Al Kalaileh (2014a) also reported a low knowledge score in Jordan (Mean = 19.3, SD 4.7), but it is still higher than that found in this study.

One of the findings of this study is that education does not make any difference to knowledge and attitudes in relation to pain management. This might be due to inadequate preparation in the nursing curriculum and in continuing education. Lack of such program could contribute to poor knowledge about pain assessment and management. It has been well documented in the literature that educational programs improve nurses’ knowledge and skills for pain management. Abdalrahim et al. reported an increase in the mean score of knowledge from 45.7% to 75% among nurses following pain management program (Abdalrahim, et al., 2011). Likewise, Qadire had found significant improvement of nurses’ knowledge and attitude following six hours of educational course on pain assessment and management (Qadire, 2014b). Thus, it is recommended that the existing syllabus in the nursing curriculum should be reviewed and an intensive and comprehensive program on pain management be set as a mandatory requirement so that student nurses may be prepared well before graduation. More in-service training
should be organized to help nurses’ competence in pain assessment and pain management, eliminate knowledge deficits and change attitudes towards effective pain management.

V. IMPLICATION FOR NURSES

This study provides information for hospital and nursing administrators that may guide and ensure the implementation of effective strategies to improve nurses’ clinical assessment skills and pain management for patients. Based on this studies review of relevant literature, the need for innovative and effective pain management education for nurses is well documented. It is imperative that all nurses be better educated and be encouraged to be reflective, evidenced-based practitioners (Wilson, 2007). As one of the most trusted professions, nursing has a tremendous responsibility in providing quality care and outcomes. An inadequate knowledge base and limited expertise are barriers to providing patients with the quality outcomes that they expect. The concept of expert nurse remains elusive, and not all nurses will attain expertise in their practice. The attainment of proficiency is the fourth phase of Benner’s theory (1984) and attainment of this phase is crucial for the nurse to understand completely the physiology and reasoning. Banning (2008) suggests that proficient clinical reasoning skills can enhance the quality of nursing practice provided through the precision of decision-making. It is proposed that clinical reasoning centers on the synthesis of specific knowledge forms; empirical, aesthetic, personal and ethical (Banning, 2008). Fisherman (2007) feels that pain management as a human right is a moral imperative that will help medicine return to its humanist roots. “Acknowledging this right is a crucial step in reversing the public health crisis of under treatment of pain”. Nurses should recognize knowledge deficits and seek to expand their knowledge base in order to provide safe and ethical care for the patients that they provide care for.

VI. RECOMMENDATIONS

More research is needed regarding nurses’ knowledge towards pain management. Further research to identify differences between specialty areas could help to determine if some nursing realms would benefit from more education on pain management. Research to assess the impact of educational interventions with nurses on their knowledge towards pain and pain management would be needed to measure the impact of continuing education programs. Additional research is needed in various geographical and practice settings to determine if deficits determined in this study are prevalent across settings.

VII. CONCLUSION

Nurses’ knowledge and attitudes towards pain management was very weak. This is a cause for concern since nurses play a pivotal role in pain management, the results of this study indicate that there are serious challenges to adequate pain management. Lack of knowledge among health care providers including nurses is one of the barriers to effective pain assessment and management. The level of knowledge reflects the quality of care that nurses are providing to patients under their responsibilities. There is an urgent need to improve nurses’ pain assessment skills for patients through regular and continues in educational and professional development program. The effect of educational program on nurses’ knowledge after implementation needs to be evaluated by future research studies.

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REFERENCES


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Analysis of Rainfall Trends and Periodicity in Ruiru Location, Kenya

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Abstract- Climate change is a serious issue in the world today with extreme weather conditions being experienced globally as characterised by devastating floods and prolonged droughts. This has often led to destruction of property and loss of life. These conditions are viewed as disasters requiring mitigation. Ruiru location being a peri-urban area has a lot of farming taking place and increased population due to settlement. This has increased the demand for water as stream flow is decreasing and boreholes are drying, with water scarcity prominent during droughts. Moreover during floods there is high surface runoff in the paved areas. The study sought to determine rainfall trends across the year for 31 years if any in Ruiru location. Monthly rainfall data for 31 years (1984-2014) obtained from four stations located within the location; Ting’ang’ a, Ruiru mills, coffee research foundation and Doondu were used. Graphs were constructed to show trends within months and years and statistical significance of the observed trends tested using a linear regression model. Statistical analysis using Mann- Kendall, Spearman’s Rho, Linear Regression and Student’s t was employed to determine the significant difference among the four stations. High annual mean rainfall of 170mm and low annual mean rainfall of 37 mm were observed. Mann- Kendall, Spearman’s Rho, Linear Regression and Student’s t showed no significant difference of rainfall means between Ting’ang’a and Ruiru Mills stations, while the other stations were statistically insignificant. Linear regression models showed an upward trend which was statistically insignificant in all the four stations. There was no significant trend across the year for the past 31 years. The research findings will help in prediction of the occurrence of high and low rainfall amounts for proper planning and water resources management.

Index Terms- climate change, linear regression, periodicity, rainfall, trends, water resources

1. INTRODUCTION

There are about 40 million people living in Kenya (Kenya population census, 2009), of which about 17 million do not have access to clean water (Municipal Council of Ruiru, 2006). For decades, water scarcity has been a major issue in Kenya, caused mainly by years of recurrent droughts, poor management of water supply, contamination of the available water resources, and a sharp increase in water demand resulting from a high population growth rate and industrial development. Lack of sufficient rainfall affects ability to acquire food and has led to eruptions of violence in Kenya (Marshall, 2011).

In many areas of Kenya, shortage of water has been amplified by government’s lack of investment in water, especially in rural areas. Most of the urban poor in Kenya also only have access to polluted water, which causes cholera epidemics and multiple other diseases that affect health and livelihoods. Despite this critical shortage of clean water in Kenya’s urban slums, there is also a large rural to urban discrepancy in access to clean water in Kenya (Marshall, 2011).

Slightly less than half of the rural population has access to water, as opposed urban population where 85 percent have access to safe water including a small portion of the urban poor in slums. Due to continued population growth, it has been estimated that by the year 2025, Kenya’s per capita water availability will be 235 cubic meters per year, about two thirds less than the current 650 cubic meters (World Bank, 2010). Groundwater plays a major role in Kenya’s development as it contributes to water for irrigation, domestic and industrial use and helps in offsetting supply deficit.

In Ruiru location, the contribution of groundwater to total supply is about 70% the remaining percentage being contributed by Ruiru-Juja Water and Sanitation Company, rainfall, rivers and Nairobi Water and Sewerage Company (RUIJASCO, 2008). There is thus pressure to increase available water resources especially groundwater resources which is a major contributor of water supply in Ruiru location. The study of groundwater levels variability will help in determining sustainability of groundwater water resources.

Water scarcity is a critical problem that causes a major challenge to socio-economic development in the world today. Ruiru location is one of such area affected by water scarcity due to its high population density as a significant population working in Nairobi and Thika towns reside in the location. High population has increased water demand leading to water scarcity. Recent studies have confirmed that Ruiru location has rapid population growth without a corresponding increase in water sources (SIPA, 2006). According to Ruiru-Juja Water and Sewerage Company (RUIJASCO), demand for water in Ruiru location is 33,161m³ per day while the company can only supply 7000m³ per day which is about 21% of the demand. The remaining 79% is obtained from other sources such as Community Based Organization's mains, boreholes, dug wells, Nairobi Water and Sewerage Company (NWSC) mains, rainfall and directly from rivers.

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Analysis show that even after completion of Jacaranda dam, RUJWASCO’s water supply cannot meet the water demand in the location. In addition, drying up of wells and decline in borehole water level during the dry season has become a major issue in recent times (Municipal Council of Ruiru, 2006). Because borehole water makes a major contribution to water supply in Ruiru location, there is need to assess its status for proper conservation and management. Rainfall is a major contributor of groundwater recharge, due to climate change there has been prolonged drought and floods which greatly impact of groundwater recharge. The study looked at variability of groundwater levels within the location and their relationship with rainfall amount and distribution.

A study on trend and periodicity in India using Seasonal and annual rainfall data of the stations: Akluj, Baramati, Bhor and Malsiras stations located in Nira Basin, Central India, were analyzed. The analysis was carried out by using Mann-Kendall (MK), Modified Mann-Kendall (MMK) and Theil and Sen’s slope estimator tests describing rising trend at all the stations. Study showed that it was statistically significant at Akluj and Bhor stations at 10% significance level. Bhor station showed the maximum increase in percentage change i.e. 0.28% in annual rainfall. Monsoon and post-monsoon seasonal rainfall showed a rising trend while the summer and winter seasonal rainfall showed a falling trend. Wavelet analysis showed prominent annual rainfall periods ranging from 2 to 8 years at all the stations after 1960s resulting in describing more changes in the rainfall patterns after 1960s. (Murumkar, 2013)

A study of Trends and periodicities of annual rainfall for 29 sub-locations of India was done using the rainfall series for a period of 124 years (1871–1994). The trends were evaluated using a linear regression technique. To identify the climatic changes, the rainfall series were subjected to 11-year moving averages. It was found that in some sub-locations the trend in one direction reverses its direction after some years. The significance of the trend values were tested. The periodicity was attributed to the quasi-biennial oscillation. Rainfall series of the most of the sub-locations and all India indicate a triennial cycle. Significant periods in the range from 3.0 to 8.0 years and 8.0 to 12.0 years were also identified (Naidu et al., 1999).

A study to analyse rainfall time series over a wide time interval was done in Campania region, southern Italy. 211 gauged stations, mainly located within the Campania region, southern Italy, was analysed for the period 1918–1999. An accurate database was set up through a data quality and time series homogeneity process. Statistical analysis of the database highlighted that the trend appeared predominantly negative, both at the annual and seasonal scale, except for the summer period when it appears to be positive. The study also showed that over the whole reference period, positive and negative trends were significant respectively for 9 and 27% of total stations and (3) over the last 30 years (Longobardi and Villani, 2009).

Rainfall and temperature trends study at Namulonge parish, in Wakiso district of Uganda used temperature and rainfall records aggregated into monthly means over a period of more than 55 years. These records were analyzed in an effort to identify both seasonal trends and shifts in climate. This was achieved by using non-parametric (Mann-Kendall) and parametric (linear regression) techniques. The analysis showed that total rainfall during the March–May season decreased, while maximum temperatures were increasing during the months between April and September, with both trends statistically significant at 5% confidence level. The Mann-Kendall test revealed that the number of wet days reduced significantly. Temperatures were found to be warmer and rainfall increasing during the months between April and September, with both trends statistically significant. (Nsubuga et al., 2011).

The objective of the study is to determine rainfall trends and periodicity in Ruiru location. Impacts of climate change have led to extreme conditions in the world such as prolonged drought and floods. These changes cause variability in rainfall, a major contributor to groundwater resources. Ruiru location depends on groundwater as a source of its water supply. Any shortcoming in groundwater levels due to prolonged drought is therefore likely to affect water supply in the location. It is therefore necessary to assess groundwater levels variability and the impact of rainfall on groundwater levels for better planning and management of groundwater resources. Provision of safe and clean water to all citizens is one of the objectives of the social pillar of Vision 2030 to which this research hopes to contribute by providing information on the sustainability of groundwater resources. With country’s new constitution, establishment of devolved government has localized many activities which are likely to increase dependence on groundwater especially in areas without sufficient surface water sources. The study will provide data and information on groundwater resources necessary for planning and development.

2.0 MATERIALS AND METHODS

2.1 Description of study area
2.1.1 Geographical Settings
Ruiru location is located at an altitude of 1564m, latitude of between 1.08333° S and 1.15°S and longitude of 36.96667°E and 37.16667° E in Kiambu County, Kenya. The construction of Thika Super Highway and Northern Bypass has put Ruiru at a strategic point as it now takes less than 30 minutes to reach Nairobi the capital city and about 15 minutes to reach Thika Town the County headquarters. The location borders Juja location to the north, machakos to the East, Githunguri to the West and Nairobi to the South. The location covers approximately 179.90 square kilometers.
2.1.2 Topographic Features
Ruiru location lies between 1,300-1,500 metres above sea level. The landscape comprises of volcanic middle level uplands.

2.1.3 Administrative and Political Units
The location lies within Ruiru sub-county and is divided into seven wards that is Mwiki, Mwihoko, Kiuu, Kahawa wendani, kahawa sukai, Gatongora and Biashara.

2.1.4 Climate
Climate is humid highland sub-tropical in character with seasonal dry and wet periods. Ruiru receives 1065 mm of rainfall annually which is bi-modal with long rains between March and May and short rains between October and December. A monthly average temperature of 18.9°C, maximum temperature of 24.9°C and a minimum temperature of 13.0°C. Temperatures are highest in the months of January to mid-March before the long rainy season and lowest in the months of July and August.

2.1.5 Soils
The soils are sandy or clay and can support drought resistant crops such as soya beans and sunflower as well as ranching. Most parts of the location are covered by soils from volcanic footbridges. These are well drained with moderate fertility. They are red to dark brown friable clays, which are suited for cash crops like coffee, tea and pyrethrum. However, parts are covered by shallow soils, which are poorly drained, and these areas are characterized by low rainfall, which severely limits agricultural development.

2.1.6 Hydrogeology
The hydrogeology of an area is the interplay of several factors of the site. These include: the nature of the parent rock; structural features of the primary and of the secondary origin; weathering processes and the resultant products; the mechanism of recharge; the recharge medium of water; quantity and its frequency; the morphology; disposition and gradient of the subsurface as well as the hydrological and topographical environment. The overall permeability of the subsurface is a result of the grain size, sorting, cementing material and the secondary feature present of joints, faults, fissures and the presence of impending layers such as aquiclude beds, often of clay or consolidated material. The aquifer complex of Nairobi which covers Ruiru reaches 400 m. The poorly defined drainage pattern points to an internal drainage model in a closed basin.

2.1.7 Socio-economic activities in Ruiru
Ruiru is well-covered with industries and coffee growing that provides employment opportunities and contributes to economic growth in the town. These industries have been instrumental in renovation, construction and expansion of schools and general infrastructure such as roads within the location. It is covered by two major hospitals Nazareth hospital and Ruiru hospital and also houses Kenyatta University Ruiru Campus. It also has many registered middle-level colleges such as Nairobi Institute of Business Studies (NIBS) and Zetech.

2.1.8 Environment, Water and Sanitation.
Ruiru location’s water resources comprises of both Surface and Ground water. There are two rivers that traverse the location; River Ruiru where Ruiru Water and Sewarage Company gets its water from and River Kamiti. Some parts of the location are also supply water by Nairobi City Water and Sewarage Company and areas outside the jurisdiction of these Companies either have no water infrastructure or are served by community water projects and boreholes. There is no sewer line in some parts of the location and majority of the communities including the major trading centres utilize septic tanks and pit latrines for human waste disposal.

2.2 Methodology
Historical monthly rainfall data for the past thirty one years was obtained from rainfall stations located within the study area. The stations included Coffee Research Foundation, Ruiru Mills and Doondu. Monthly rainfall for 31 years (1984-2014) was obtained from four stations i.e Ting’ang’a, Ruiru mills, Doondu and Coffee Research Foundation located within Ruiru constituency. Statistical analysis was carried out to assess any rainfall significant difference among the four stations using Mann- Kendall, Spearman’s Rho, Linear Regression and Student’s t. Graphs were constructed to show any trend in the monthly and annual rainfall. Statistical analysis was done to indentify any significant trend using Linear regression model. Linear regression model is explained in the form of

\[ y = a + bx \]

\( b = \text{slope} \)

\( a = \text{intercept} \)

The slope explains the trend, if the slope is negative the the trend is decreasing or downward trend and if the slope is positive the the trend is increasing or increasing. The null hypothesis is that the slope of the line is zero i.e there is no trend in the data. The significance of the data is shown by the p-values with the significance level of 0.05. If the p-value is less than the significance level then the null hypothesis is rejected and if its more the null hypothesis is not rejected. The R-squared is the correlation coefficient which is used to show how strong is the correlation between x and y. R^2 range between 0 and 1. 1 means there is a strong correlation while 0 means there is no correlation. The correlation strength increases from 0 to 1.

The Periodicity test was performed using Wavelet analysis because it shows the rainfall amounts and frequency of occurrence. Recent periodic analysis approaches have however been based on wavelet analysis (Daubechies, 1992). In this study wavelet analysis was used to study periodicity in rainfall in Ruiru location. Wavelet analysis is a tool for analyzing non-stationary variance at many different frequencies (Daubechies, 1992) within a geophysical time series (Torrence and Compo, 1998; Smith, et al, 1998; Labat, et al., 2005). Wavelets are a set of limited duration waves, also called daughter wavelets, because they are formed by dilations and translations of a single prototype wavelet function \( \psi(t) \), where \( t \) is real valued, called the basic or mother wavelet. The mother wavelet designed to oscillate like a wave, is required to span an area that sums to zero and die out rapidly to zero as \( t \) tends to infinity.

\[
\int \Psi(t)dt = 0 \tag{3.1}
\]

In this study to compute the wavelet power, the Morlet wavelet \((k = 6)\), was used because its structure resembles that of a rainfall time series, given by

\[
\Psi(t) = \pi^{-1/4}e^{i6t}e^{-t^2/2} \tag{3.2}
\]

Examples of other wavelet functions include the Paul, Mexican hat and derivative of Gaussian (DOG), details are given in Torrence and Compo (1998).

The continuous wavelet transform \( W_n \) of a discrete sequence of observations \( x_n \) is defined as the convolution of \( x_n \) with a scaled and translated wavelet \( \psi(\eta) \) that depends on a non-dimensional time parameter \( \eta \)

\[
W_n(s) = \sum_{n=0}^{N-1} x_n \psi(\eta) \left[ s \right] \tag{3.3}
\]

Where \( n \) is the localized time index, \( s \) is the wavelet scale, \( \delta t \) is the sampling period, \( N \) is the number of points in the time series and the asterisk indicates the complex conjugate. Since complex wavelets lead to complex continuous wavelet transform, the wavelet power spectrum, defined as, \( |W_n(s)|^2 \) is a convenient description of the fluctuation of the variance at different frequencies. Further, when normalized by \( \sigma^2 \) (where \( \sigma^2 \) is the variance) it gives a measure of the power relative to white noise, since the expectation value for a white noise process is \( \sigma^2 \) at all \( n \) and \( s \).

To determine significance levels for wavelet spectrum an appropriate background spectrum was be chosen. The many geophysical phenomena, an appropriate background spectrum is either while noise (with a flat Fourier spectrum) or red noise (increasing power with decreasing frequency) (Torrence and Compo, 1998). It has been shown on average that the local wavelet power spectrum is identical to the Fourier power spectrum given by

\[
P_k = \frac{1 - \alpha^2}{1 + \alpha^2 - 2\alpha \cos \left( \frac{2\pi k}{N} \right)} \tag{3.4}
\]
where \( k = 0 \ldots \frac{N}{2} \) is the frequency index. By choosing an appropriate lag-1 autocorrelation equation (14) can be used to model a red-noise spectrum. If \( \alpha = 0 \) in equation (14) then it models a white noise spectrum.

If \( X_n \) is a normally distributed random variable, then both the real and imaginary parts of \( \hat{X}_k \) are normally distributed (Chatfield, 1989). Hence \( |\hat{X}_k|^2 \) is chi-square distributed with two degrees of freedom, denoted by \( X^2 \). In order to determine the 95% confidence level, the background spectrum in equation (14) is multiplied by the 95\(^{th}\) percentile value of \( X^2 \) (Murumkar, 2013). The confidence interval at each scale can be used to construct confidence contours. In this study the 95% confidence limit was used to study the periodicity seasonal rainfall in Ruiru location.

### 3.0 Results and Discussion

#### 3.1 Rainfall Trend and periodicity

##### 3.1.1 Coffee Research Foundation (CRF) Station

**Figure 2: Rainfall trends in CRF**

High total annual rainfall of 1541.8mm was recorded in the year 2006 and low amounts of 529.9mm in the year 2000. There was an increasing trend from 1984 to 2014 though not significant.

**Figure 3: Mean monthly rainfall trend in CRF**  
\[ y = -0.130x + 88.08 \]  
\[ R^2 = 5E-05 \]
High mean monthly rainfall of 209.3mm in the month of April followed by 175.3mm in the month of November was experienced with the monthly mean of 22.5mm in the month of August. There was an insignificant decreasing trend with double maxima in April and November.

**Table 1: summary statistic of trend for CRF**

<table>
<thead>
<tr>
<th>Data file : crf tr.csv: RAINFALL</th>
<th>Test statistic</th>
<th>Critical values</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Statistical table)</td>
<td>a=0.1 a=0.05 a=0.01</td>
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<tr>
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<td>0.017</td>
<td>1.645 1.96 2.576</td>
<td>NS</td>
</tr>
<tr>
<td>Spearman's Rho</td>
<td>0.031</td>
<td>1.645 1.96 2.576</td>
<td>NS</td>
</tr>
<tr>
<td>Linear regression</td>
<td>0.094</td>
<td>1.699 2.045 2.756</td>
<td>NS</td>
</tr>
<tr>
<td>Student's t</td>
<td>0.66</td>
<td>1.697 2.042 2.75</td>
<td>NS</td>
</tr>
</tbody>
</table>

H$_{null}$ : there is no trend in the rainfall trend analysis for 31 years in coffee research foundation
H$_{Alter}$ : there is a trend in the rainfall trend analysis for 31 years in coffee research foundation.

The p-value calculated using winks software was 0.42 which is greater than the significant value of 0.05. Therefore the null hypothesis was not rejected meaning there is no trend in the rainfall analysis for 31 years in Coffee research foundation station.

![Wavelet power spectrum MAM and OND for CRF](image)

**Figure 4: Wavelet power spectrum MAM and OND for CRF**

Relatively higher power wavelet spectrum was observed within the band of approximately 2-5 years between 1993 and 2004 which was significant using the March April and May (MAM) wet season. In the October, November and December (OND) higher power spectrum was observed within the band of approximately 0-2 years between the year 1992 and 2000.

High total annual rainfall of 1541.8mm was recorded in the year 2006 and low amounts of 529.9mm in the year 2000. There was an increasing trend from 1984 to 2014 though not significant.

**3.1.2 Ndoondu Station**
High total annual rainfall of 1658.5mm was recorded in the year 1998 and low amounts of 574.7mm in the year 1984. There was an increasing trend from 1984 to 2014 though not significant.

High mean monthly rainfall of 216.9mm followed by 175.9mm in the month of April and November respectively was experienced with the monthly mean of 21.0mm in the month of August. There was an insignificant decreasing trend with double maxima in April and November.

<table>
<thead>
<tr>
<th>Test statistic</th>
<th>Critical values</th>
<th>Result</th>
</tr>
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<td>a=0.05</td>
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<td>Mann-Kendall</td>
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<td>Spearman's Rho</td>
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<tr>
<td>Linear regression</td>
<td>0.518</td>
<td>1.699</td>
</tr>
<tr>
<td>Student's t</td>
<td>0.194</td>
<td>1.697</td>
</tr>
</tbody>
</table>
H\textsubscript{null} : there is no trend in the rainfall trend analysis for 31 years \\
H\textsubscript{Altr} : there is a trend in the rainfall trend analysis for 31 years. \\
The p-value calculated using winks software was 0.667 which is greater than the significant value of 0.05. thus the null hypothesis was not rejected meaning there is no trend in the rainfall analysis for 31 years in Doondu station.

![Figure 7: wavelet power spectrum OND and MAM for Ndoondu](image)

High power spectrum was observed within the band of 0-4 years in the year 1995 and 2000 which was significant. Relatively higher power spectrum was observed within the band of 4-8 years between 2009 and 2014 though it was not significant in the OND season. During the MAM season relatively higher power spectrum was observed within 2-5 years band in the years of 1994 to 2000. High total annual rainfall of 1658.5mm was recorded in the year 1998 and low amounts of 574.7mm in the year 1984. There was an increasing trend from 1984 to 2014 though not significant.

3.1.3 Ruiru mills station
High total annual rainfall of 1459.95 mm was recorded in the year 1989 and low amounts of 444mm in the year 2000. There was an increasing trend from 1984 to 2014 though not significant.

High mean monthly rainfall of 199.9mm followed by 158.6mm in the month of April and November respectively was experienced with the monthly mean of 18.6mm in the month of July. There was an insignificant decreasing trend with double maxima in April and November.

<table>
<thead>
<tr>
<th>Data file: Ruiru mills.csv: MEAN ANNUAL RAINFALL</th>
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<th>Critical values</th>
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<td>a=0.1</td>
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<td>Mann-Kendall</td>
<td>0.986</td>
<td>1.645</td>
<td>1.96</td>
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Hnull: there is no trend in the rainfall trend analysis for 31 years in Ruiru Mills
HAlter: there is a trend in the rainfall trend analysis for 31 years in Ruiru Mills.
The p-value calculated using winks software was 0.401 which is greater than the significant vaue of 0.05. thus the null hypothesis was not rejected meaning there is no trend in the rainfall analysis for 31 years in Ruiru Mills station.

<table>
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<th>Student's t</th>
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**3.1.4 Rainfall Trends for the Three Stations**

Hnull – No significant difference in the mean annual rainfall among the stations
HAlter – There is a significant difference in the mean annual rainfall among the four stations
The calculated p-value according to winks software was 0.006 comparing Ting’ang’a and Ruiru mills. The null hypothesis was rejected meaning there was significant difference between the two. The p-value between Ting’ang’a and Coffee research Foundation, Ting’ang’a and Doondu, Doondu and Ruiru mills, Doondu and Coffee Research Foundation, Coffee Research Foundation and Ruiru mills were 0.149, 0.342, 0.934, 1.00 and 1.00 respectively which are greater than 0.05. The null hypothesis was not rejected therefore there was no significant difference between the stations.

**Figure 10: Wavelet power spectrum MAM and OND for Ruiru Mills**
During the MAM wet season high power spectrum was observed within the band of 3-5 years in the year of 1999 to 2005 which is significant. In the OND season, high power spectrum was observed within the band of 0-3 years between the year 1995 and 2001 and its signicant.
High total annual rainfall of 1459.95 mm was recorded in the year 1989 and low amounts of 444mm in the year 2000. There was an increasing trend from 1984 to 2014 though not significant.
CONCLUSION

There was an increasing rainfall trend across the four rainfall stations i.e Ndooondu, Ting’ang’a, Ruiru mills and Coffee Research Foundation for the years 1984 to 2014. The trend was not significant as the p-value was greater than 0.05 and hence the null hypothesis was not rejected. The null hypothesis was adopted meaning there was no significant trend. It was recommended that more research on the impact of climate change on water resources and determination of net recharge should be done. Water conservation measures should be adopted to avoid wastage.

ACKNOWLEDGMENT

The authors wish to acknowledge the support and assistance provided by workers at the coffee and tea farms sampled. The facilitation and assistance of Civil, Construction and Environmental Engineering environmental laboratory of Jomo Kenyatta University of Agriculture and Technology has also been appreciated by them. I thank Grinsted for the wavelet coherence tool used for wavelet analysis for this study. I will also wish to thank the International Foundation of Science for funding the project.

REFERENCES

Regional Expansion in Tana to Raja of South Sulawesi Province

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Abstract- This research purpose to describe and analyze society participation, local political elite participation, local government role, and regional parliament in the process of area expansion of TanaToraja Regency, and describe and analyze autonomy area expansion of public service. The method used in this research was the explanatory survey. The data collection conducted by using interview, observation, questionnaire and document study. The research informants include local leaders, regional government, Regional Parliament Members, nongovernmental organizations, social organization. The sample was collected by using purposive sampling, and data were analyzed descriptively. The results of this research showed that the society of TanaToraja Regency participates actively to support and influence decision making of area expansion in TanaToraja Regency, and to form of the new autonomous regency of North Toraja. The local political elites so participate in support and influence decision making of area expansion in TanaToraja Regency and to form of the new autonomous regency of North Toraja. The regional government of TanaToraja Regency as well as take the role in support and influence decision making of area expansion in TanaToraja Regency. Regional Parliament has an active role in support and influence decision making of area expansion in TanaToraja Regency and to form of the new autonomous regency of North Toraja. The role of Regional Parliament follow up the society aspiration and socialization of the area expansion purpose. The area expansion of TanaToraja Regency and the formation of new autonomous regency impact to the improvement of public service in the education field, health, and infrastructure.

Index Terms- autonomous regency, regency expansion, public service.

I. INTRODUCTION

The implementation of regional autonomy that should seriously be concerned is how autonomous regions can realize and sustain a democratic society life. This is in addition to the already asserted by Act No. 22 of 1999 and then revised by Act No. 32 of 2004 on local government, also it is the demands of the times and modern civilization, both in governance and arrangement of social, civic and state.

Law No. 32 of 2004 on local government autonomy is affirmed that the rights, powers, and obligations of autonomous regions to set up and manage their own affairs and interests of local communities in accordance with the legislation. Policy of regional autonomy through the Law of local government opportunities forming regions to form the merger of several regions or parts of regions that together perform a division of the region into two regions or more, and the expansion of the region into two regions or more can be made after reached the minimum age of governance (article 4 of Law No. 32 of 2004).

Forming regions referred to in Article 4 of Law No. 32 of 2004 on local government must qualify the administrative, technical and physical territoriality. Administrative requirements for the province include the approval of District / Municipal and regents/mayors will be coverage of the province, the provincial parliament approval parent, and governor, as well as the recommendation of the Minister of Home Affairs. Terms administratively to District / City covering their approval Regency / City Regional People's Representative Assembly and the Regent / Mayor is concerned, the approval of Parliament and the Governor Propinsi and recommendations Minister of Home Affairs. Technical requirements include factors on which to base that includes the establishment of a regional economic capacity factor, the potential of the area, defense, security, and other factors that enable the implementation of regional autonomy. The terms of physical include at least five District / Municipality for the establishment of at least five provinces and the District for the establishment of district and four sub-district for the establishment of the city, location, potential capital, facilities, and government infrastructure.

Establishment and expansion of regions in the era of regional autonomy can not be denied as a result of the policy of regional autonomy that is used by local political elites. To take advantage of this opportunity, several regions in Indonesia including several areas in South Sulawesi Province dissociate oneself from its parent assuming that built that of the area to improve the welfare of the people, improving the quantity and quality of public services and bring government closer to the people. It is being developed by the local political elite to the community so that the demands of regional expansion continues.

Based on the observations and supported by some of the survey results, which developed into a regional division division problem. It can be identified as follows:

First, regional division aims to improve people's welfare, the fact that there is regional expansion further away from the people's welfare. Ministry of Home Affairs in the evaluation results mentioned 104 areas (five provincial and 97 districts) occurred in 2000, one year after the enactment of Law No. 22 of 1999 there were 76 areas are still the problematic start of asset parent regions that have not been handed over to autonomous regions until the location of the capital uncertain (Kompas March 3, 2006).

Second, the Local Government Act disallows the regional division has produced 104 new autonomous regions (four provincial and 100 district/city) fantastic figures for the addition
of new areas on the Indonesian island countries, making it appear as if the central government pursued the target to shape their neighborhoods new areas. No half-hearted, there is even a newly established area, already split the new area again. (Example Luwu three years old). Luwu Utara has generated division LuwuTimur (2003). On the other hand, the reason that is always used the central government is to improve the welfare of society through models bring government closer to the community and local political elites on the other hand also gave the reason that the regional division of public services is getting better. However, it is not uncommon in new areas has raised controversy in the community, which then triggers the horizontal and vertical conflicts in which people become victims. Example PolewaliMamasa causing horizontal conflicts in the region and MambíAraleTambulahan triggered by the expansion of PolewaliMandar and Mamasa.

Third, the new regional division pain for the mother, the assumptions developed in the region expansion is the main district "self-sacrifice", because they have to release some of its territory, population, and its assets. Problems arising from the main district and district division is the division of assets and local revenue the cause is an imbalance between regional income earned (financial conflict) by the district as a major source of local revenue (PAD), which consists of market tax, parking, housing Hospitals, bus terminal. Unclear directions of regional expansion into an active stimulus that encourages regions to be separated from its mother and stood alone into autonomous regions.

Fourth, the legal framework has been used in the region expansion is Government Regulation No. 129 of 2000. Government Regulation is a derivative of the Act number 22 of 1999 on local government. But the government regulations is the establishment of requirements and criteria for expansion, deletion, and incorporation of the area is still considered loose.

Various problems that accompany the process of expansion during this time as strengthening the alleged absence of a large design (grand design), the basis for determining the extent to which the expansion with subnational governments in this country. Indeed the establishment of regional efforts is to improve the public services that primarily improve the welfare of the people, the expansion of space for political education, community empowerment, and to optimize the use of natural resources that can be enjoyed by the community. However, in practice, often more motivated by regional expansion pursuing funding from the regional center of the edges stimulate corruption. And the process of regional expansion that took place since 1999 rolling uncontrollably. Based on the multiple phenomena of the expansion process of the autonomous regions, the focus of this paper on the results of the study tries to reveal the level of public participation in the process of regional expansion, the level participation of local political elites, the role of local government (Regents and Legislature), and the impact of the expansion of public services in the District North Toraja.

II. THEORETICAL STUDY

Autonomous region expansion is the fruit of a political policy of decentralization that gave birth to regional autonomy, opening up space for the region to split the new area as mandated by law on local government. Establishment and expansion of regions, forming regions are giving status to certain areas as provincial or district/city, while the regional division is solving the provincial or district/city into two or more regions (government regulations number 78 of 2007 concerning the procedures for the establishment, abolition and the merging of regions). Expansion of the autonomous region has been studied by experts among others Dwiyanto (2006), Efendy (2007, Pratikno (2008), Retananingsih (2008), Infallible (2008), Leemaas (1970), Burhan (2011), Maryono (1958), (Ferrasi (2007).

Level of Public Participation in Process Autonomous Regional Expansion

In the formation of new autonomous regions, is widely acknowledged the role of community participation is necessary because people expect their government as the owner of the proximity of government and society. Therefore the level of willingness and the willingness of the community to participate in the implementation of governmental tasks and the implementation of regional autonomy greatly enhances the ability of the new autonomous region held government affairs submitted by the central government.

The level of community participation North Toraja regency in the process of establishing autonomous regions is an essential element inherent in the process. But it does not mean everyone can participate with the same intensity and capacity. This is because of differences in abilities, differences in interests, skill differences between members of the community with one another.

Participation of Local Political Elites In Redistricting Process Autonomous Region. Political elites are individuals who topped the major institutions in society. Because of its institutional position, the political elite has the ability to issue political decisions are valid and binding on all members of society. Power political elite to make and carry out decisions can be expressed rooted in institutions where they are at the top. Through these institutions, those belonging to the group can carry out political elite and also impose decisions to adhere to other members of society (MeriamBudiardjo, 1984).

In connection with this, the new autonomous region expansion is a political policy of decentralization in the form of regional autonomy. Autonomous region expansion is not a direct impact on the public welfare but only meet the aspirations and interests of the local political elite in the autonomous region expansion plays an important and quite got the attention of the government (Kompas, 20 November 2012).

Participation of the local political elite is the elite political participation both working at the local government bureaucracy and outside the government, bureaucracy can be a factor in the formation of new autonomous regions.

Role of Local Government in the Autonomous Region Redistricting Process.

The regional governments are organizing government affairs by the local government and the Parliament according to the principle of autonomy and duty and principle of the Unitary Republic of Indonesia as stipulated in the Constitution of the Republic of Indonesia in 1945. In the establishment of new autonomous regions on the part of local government both Regent and the executive, the device and the House of Representatives regional People Parent plays an important and strategic and is
one indicator of administrative requirements mandated by the Act for the establishment of new autonomous regions.

III. ROLE OF LOCAL GOVERNMENT OF TANATORAJA

The local government of TanaToraja as the district Parent is the Regent and the device has a decisive role in the process of formation of new autonomous regions are North Toraja district. In Article 5 of Law 32 of 2004 the results of the revision of Law No.22 of 1999, affirmed that the establishment of autonomous regions as referred to in Article 4 must be qualified administrative, technical, and physical territoriality. Administrative requirements for the establishment of new autonomous regions, namely the approval of the district Parent Regents and Regional People's Representative Assembly.

TanaToraja Regency Role in New Autonomous Regional Expansion Process

Legislative Council of TanaToraja is local people's representative body and serves as an element of the regional administration plays an important and strategic in the process of formation of North Toraja district. The formation of new autonomous regions must fulfill the administrative requirements, namely the approval of Parliament and head Local District Parent (TanaToraja), the role of district Regional People's Representative Assembly of TanaToraja can be seen in the performance of duties and obligations to be executed in the process of formation of North Toraja district.

First, the Regional People's Representative Assembly as the Institute of Regional People's Representatives is obliged to absorb, collect and follow up the people's aspirations. Based on the review of documents obtained information that the aspirations of the people of TanaToraja Northern Territory in the form of a list of questions written support signed by approximately 556 (five hundred and fifty-six) public figures, submitted formally to the regency of TanaToraja precisely on 2 September, TanaToraja regency respond positively and accept the aspirations of appropriate mechanisms aspiration reception in Parliament (History of the Struggle Formation of North Toraja Regency, 2002: 42).

Second, the Regional People's Representative Assembly of TanaToraja Regency reabsorb the aspirations of the people who fight for the division of TanaToraja district of North and follow up these aspirations to affirm the committee deliberations prepare the agenda for the plenary session of parliament for discussion of the aspirations of the community that continues to grow. On 12 September 2002 Parliament held a plenary session receive the aspirations of the community that continues to grow. On 24 September 2002 to implement the TanaToraja regency plenary session and take a decision on the division of North Toraja district and designated by decree of Parliament No: 11 / KEP / DPRD / IX / 2002. By decision of the Parliament, it can answer the aspirations of the people.

The impact of the Autonomous Regional Expansion of Public Service and Public Welfare

Regional expansion or creation of new autonomous regions in the organization of regional autonomy aimed at shortening the span of control of local government services and the Regional Representatives Council to the public in improving the people's welfare.

In conjunction with the expansion of new autonomous regions is North Toraja regency which was established by Law No. 28 The year 2008, which is the result of the division of TanaToraja. From the review of the document and supported by a wide range of information obtained from informants that the formation of North Toraja Regency aims to gain government control range of the districts in the area of North Toraja Regency very much to the mains, and improve public services.

IV. CONCLUSION

The proliferation of New Autonomous Region of North Toraja is a result of the decentralization policy fruit in the form of regional autonomy was passed through Act 28 of 2008. Where participation levels of society and participation of the local political elite and the government's role and the role of parliament will determine the formation of the autonomous region. The impact of the expansion of the autonomous regions of North Toraja is a change in public services in order to improve the welfare of society.

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Design and Analysis of Hot Runner Injection Mould for Water Bottle Caps

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Abstract- Injection moulds are divided into two types based on runner design (i.e.) Cold runner moulds and Runner less moulds (i.e.) hot runner moulds. In cold runner moulds, for multi-cavity and multi-point injection moulds, there is wastage of material in runner area. Sometimes wastage of material is more than component weight. For avoiding the above problem, the technique used is hot Runner moulds. Hot runner mould is one of the advanced manufacturing methods for multi-cavity type moulds. These types of moulds are commonly used for large production rate. While producing plastic components using normal/standard multi-cavity mould, we are facing the problems like partial filling, cavities in components, less product quality, injection pressure and temperature drop age and warpage etc...

To overcome these problems, hot Runner mould is designed and modeled in PROE 5.0 and tested. Then the thermal analysis is carried out to find out the thermal variations due to the injection pressure of a molten plastic into the cavities of the mold by using Simulation Technology.

Index Terms- Hot Runner Injection Mold, Finite Element Model, 3D numerical method, temperature analysis.

I. INTRODUCTION

Injection molding is a method of forming a plastic product from powdered thermoplastics by feeding the material through the machine component called the hopper to a heated chamber in order to make it soft and force the material into the mold by the use of the screw. In this whole process, pressure should be constant till the material is hardened and is ready to be removed from the mold. This is the most common and preferable way of producing plastic products with any complexity and size.

The runner system accommodates the molten plastic material coming from the barrel and guides it into the mould cavity. Its configuration, dimensions, and connection with the moulded part affect the mould filling process and, therefore, largely the quality of the product. In other words, the runner system dictates part quality and productivity. Runner systems in conventional moulds have the same temperature level as the rest of the mould because they are in the same mould block. The ideal injection moulding system delivers moulded parts of uniform density, and free from all runners, flash, and gate stubs. To achieve this, a hot runner system, in contrast to a cold runner system, is employed. The material in the hot runners is maintained in a molten state and is not ejected with the moulded part. Unlike an ordinary cold runner, the hot runners are heated, so the plastic melt in the hot runners never freeze.

Hot runner systems were first developed and came into sporadic use in the early 60s with generally negative results. They gained popularity in the 80s and 90s as technological advantages allowed improved reliability and the escalation of plastic materials prices made hot runner systems more desirable and cost effective. Hot runners are fairly complicated systems, they have to maintain the plastic material within them heated uniformly, while the rest of the injection mold is being cooled in order to solidify the product quickly. For this reason, they are usually assembled from components pre-manufactured by specialized companies.

Injection moulding is a manufacturing process for producing parts by injecting material into a mould. Injection moulding can be performed with a host of materials, including metals, glasses, elastomers, and most commonly thermoplastic and thermosetting polymers. Material for the part is fed into a heated barrel, mixed, and forced into a mould cavity where it cools and hardens to the configuration of the cavity. The manufacturing of thin-wall products is very important for the automotive industry because thinner components allow considerable overall weight savings, beneficial effects on the reduction of fuel consumption and improvement of environmental impact. In addition, the decrease in thickness allows significant cuts in production costs due to less material being used and shorter cycle times. All materials used for automotive applications such as metals, foams, plastics and composites are investigated in order to achieve reductions in product thickness. In particular, thin-wall fabrication of plastic products allows the realization of smaller and lighter parts which
can withstand day-to-day use while maintaining their aesthetic appearance.

Injection molding permits mass production net shape manufacturing of high-precision, three-dimensional of plastic parts.

Injection Molding Machine

The injection molding process stages starts with the feeding of a polymer through hopper to barrel which is then heated to the sufficient temperature to make it flow, then the molten plastic which was melted will be injected under high pressure into the mold the process is commonly known as Injection. After injection pressure will be applied to both platens of the injection molding machine(moving and fixed platens) inorder to hold the mold tool together afterwards the product is set to cool which helps it in the solidification process. After the product gets its shape the two platens will move away from eachother inorder to separate the mold tool which is known as mold opening and finally the molded product is ejected or removed from the mold. And the process will repeat itself.

II. HOT RUNNERS OFFER THE FOLLOWING ADVANTAGES

- No loss of melt and thus less energy and work input
- Easier fully automatic operation.
- Longer holding pressure, which leads to less shrinkage.
- Shorter cycles; cooling time no longer determined by the slowly solidifying runners; no nozzle retraction required.
- Machines can be smaller because the shot volume, around the runners, is reduced, and the clamping forces are smaller because the runners do not generate reactive forces since the blocks and the manifold block are closed.
- Superior quality because melt can be transferred into the cavity at the optimum sites.
- Gates at the best position; thanks to uniform, precisely controlled cooling of the gate system, long flow paths are possible.
- Pressure losses minimized, since the diameter of the runners is not restricted.
- Artificial balancing of the gate system can be performed during running production by means of temperature control or a special mechanical system (e.g. adjustment of the gap in a ring-shaped die or use of plates in the low channel).

III. CLASSIFICATION OF HOT RUNNERS

Hot runners may be classified according to how they are heated. There are two main types of hot runner systems, insulated runners and heated runners. Within the heated runners, there are two categories, the externally heated and internally heated.

**Insulated runners** Insulated runner moulds have oversized passages formed in the mould plate. The passages are of sufficient size that, under conditions of operation, the insulating effect of the plastic (frozen on the runner wall) combined with the heat applied with each shot maintains an open, molten flow path.

**Heated runners** for heated runner systems, there are two designs: internally heated and externally heated. The first is characterized by internally heated, annulus flow passages, with the heat being furnished by a probe and torpedo located in the passages. This system takes advantage of the insulating effect of the plastic melt to reduce heat transfer (loss) to the rest of the mould. The second consists of a cartridge-heated manifold with interior flow passages. The manifold is designed with various insulating features to separate it from the rest of the mould, thus reducing heat transfer (loss).

**Internally heated systems** eliminate most leaking problems, provides good isolation of the heater from the surrounding mould and provides good gate tip control. As heaters are internal, there is no need for a separate manifold block, which must be heated and insulated from the surrounding mould with an air space. The plastic around the perimeter of the flow channel freezes against the colder mould, solidifies and provides a thermally insulating boundary of plastic. This reduces the challenge with externally heated hot runner systems of insulating the heat from the part-forming cavity where you are trying to freeze the plastic. In addition, without the air gap surrounding the manifold in an externally heated system, leakage concerns are virtually eliminated.
IV. DESIGN OF HOT RUNNER DIE

![Image of part design](image)

**Figure 3: Part design**

![Image of drafting](image)

**Figure 4: Drafting**

V. INTRODUCTION TO ANSYS

ANSYS is a general-purpose finite element analysis (FEA) software package. Finite Element Analysis is a numerical method of deconstructing a complex system into very small pieces (of user-designated size) called elements. The software implements equations that govern the behavior of these elements and solves them all; creating a comprehensive explanation of how the system acts as a whole. These results then can be presented in tabulated or graphical forms. This type of analysis is typically used for the design and optimization of a system far too complex to analyse by hand. Systems that may fit into this category are too complex due to their geometry, scale, or governing equations.

ANSYS is the standard FEA teaching tool within the Mechanical Engineering Department at many colleges. ANSYS is also used in Civil and Electrical Engineering, as well as the Physics and Chemistry departments. ANSYS provides a cost-effective way to explore the performance of products or processes in a virtual environment. This type of product development is termed virtual prototyping. With virtual prototyping techniques, users can iterate various scenarios to optimize the product long before the manufacturing is started. This enables a reduction in the level of risk, and in the cost of ineffective designs. The multifaceted nature of ANSYS also provides a means to ensure that users are able to see the effect of a design on the whole behavior of the product, be it electromagnetic, thermal, mechanical etc.

VI. THERMAL ANALYSIS OF HOT RUNNER DIE FOR ORIGINAL MODAL

![Image of imported model](image)

**Figure 5: Imported model**

![Image of meshed model](image)

**Figure 6: Meshed model**

![Image of temperature](image)

**Figure 7: Temperature**

![Image of heat flux](image)

**Figure 8: Heat flux**
VII. THERMAL ANALYSIS OF HOT RUNNER DIE FORMODIFY MODAL (CHANGING THE INSERTS IN THIS MODEL)

Figure 9: Directional heat flux

Figure 10: Imported model

Figure 11: Meshed model

Figure 12: Temperature

Figure 13: Heat flux

Figure 14: Directional heat flux

VIII. RESULTS

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IX. GRAPHS

Figure 15: Comparison of Temperature, Heat flux and Directional Heat flux for Original model and Modify model

X. CONCLUSION

The runner system accommodates the molten plastic material coming from the barrel and guides it into the mould
cavity. Its configuration, dimensions and connection with the molded part affect the mould filling process and, therefore, largely the quality of the product. In other words, the runner system dictates part quality and productivity. In the present work, structural and thermal analysis varied out on original and modified designs of the mould and the results reveals that the deformation, stress, strain and thermal deformations are improved and modified design gives the best output.

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Gauging impact of Factors which increase the preference of Online Sales: Evidence from the market of Karachi

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Abstract- It has been observed that online sale’s is the factor which is used by companies in order to optimize their sales and profitability. As the technique provides convenience to customers therefore it has also been considered and preferred by customers all over the world. In fact businessmen in Pakistan is also preferring online sales and use of E-Commerce and more than 100 websites are available for online sales and purchase but there are some factors which needs to be considered and optimized in order to increase the use of online method for purchase. Because customers who are involved in these activities are also gained a level of maturity and want something new and more effective from the vendors as the point of difference of their company and competing companies therefore researches from different authors has been examined and through these it has been concluded that there are various variables which are creating impact on online sales and after using structural equation modeling through AMOS it has been found that all the variables included in the research model are significant in creating impact on online sales except variety of products available on the website.

Index Terms- Online Sales, Convenience, Perceived Price, Customer Characteristics, Variety, Customization, Information Availability, Website Factors, Trust, Perceived Risk,

I. INTRODUCTION

Internet is treated as the mother of E-Commerce due to which are using this new form of commerce for conducting trade in easy and unique form. Because of this we are able to circulate required level of capital, information and merchandise more effectively and efficiently. Moreover it is also act as the base of competitive edge as company using E-Commerce will have the edge over the competitors as it reduces the cost of operations for the company which is using it for the transfer of its requirements from one place to another. (Qureshi., Fatima. & Sarwar., 2014) While it is also indicated by the research the in upcoming times E-Commerce will be the necessary part of each and every activity of human society like education, government, production and employment etc. (Qin., Shunding., Yi., Jichun., Lixiang. & Jun., 2009) As the use of internet is not only providing companies a solid platform for marketing but also helps consumers in making desired and appropriate decision. (Clemes., Gan. & Zhang. 2014) While the another advantage of the use of E-Commerce is that it creates paperless working for companies which are interested in exchange of information with consumers, businesses and countries with the help of internet applications. (Bajaj. & Nag., 2005)

Most common examples of Online sales is of Dell Computers which are involved in selling desktop PC’s, Printers and Scanners to individual as well as corporate customers. When company purchases any product from the other company via use of online medium then it is termed as “Business to Business Online Shopping” While Cisco is the another example in this regards which provides hardware as well as software solution to other business via use of online medium. While in consumer to consumer online shopping there is a role of website controlled and managed by third party who facilitates the business and charges its commission. While most common example of these type of business are E-Bay etc (Qureshi., Fatima. & Sarwar., 2014)

While the idea of online shopping first came into existence before the processing of real time transaction from domestic television on worldwide web, the technology through which the local television was became able to do so is known as “Videotext” and it was invented by M. Aldrich in the year 1979. Amazon was the one which takes advantage of this innovation and expanded its business in the year 1995 while E-Bay started its business in the year 1996. (Qureshi., Fatima. & Sarwar., 2014) Research indicates that there are more than 100 websites are available in Pakistan through which companies are conducting online business while it has been also observed that these type of business are experiencing massive growth since last two to three years and if continue flourishing in the same pattern then E-Commerce will also continue to flourish in the country. (Chaudary., Nisar. & Rehman., 2014)

II. STATEMENT OF PROBLEM

It is indicated through research that more than 20% population of the world is already engaged in using internet for their the purchase of their requirements (Taylor., 2002) and due to this E-Commerce is transforming as the major activity to conduct business. (Jenyo. & Soyoye., 2015) Research of year 2008 emphasizes that company must try to capture new opportunities created by the use of latest technology otherwise the business will be forced towards the decline phase. (Schroen. & Tang., 2008) While the other research indicated that connectivity level through applying internet has been increased in developed as well as in developing countries. (Armesh., Salarzzehi. & Yaghoobi., 2010) and this extra ordinary increase in the use & access of internet is also one of the most critical factor in the increase use of Electronic commerce which is based not only upon buying and selling products but it is also linked with the sharing of information between organization and its customer. (Laudon. & Traver., 2001) But due to
continuous involvement in online activities, customers who are involved in online business also become mature and due to this online sellers realizes that there is a urgent requirement of professional approach which must also be a customer oriented in nature. (Jenyo. & Soyoye., 2015)

As the use of internet is a common element since 1990’s but still there are several research work which indicates that empirically as well as subjectively that still there are several online firms who are not completely aware of the behavior of online customers. (Lee., 2002) On the other hand researches which tried to evaluate the impact of factors influencing online shopping in Pakistan indicated that it according to the expectations of researchers E-Commerce will change the way through which we are doing business currently more over it will also affect most of human activities in coming future. (Qureshi., Fatime. & Sarwar., 2014)

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III. RESEARCH QUESTION

“What are those factors which are responsible for the success of Online shopping in Karachi city?”

IV. RESEARCH OBJECTIVES

Objectives of this systematic research are listed below:

a. To check the impact of convenience on the acceptance of online shopping
b. To view the affect of perceived price on the acceptance of online shopping
c. To judge the resultant of customer characteristic on the acceptance of online shopping
d. To see the viewpoint of variety on the acceptance of online shopping
e. To estimate the outcome of customization on the acceptance of online shopping
f. To view the end point of information availability on the acceptance of online shopping
g. To check the output of website factors on the acceptance of online shopping
h. To determine the answer of trust on the acceptance of online shopping
i. To estimate the force generated by perceived risk on the acceptance of online shopping

Developing the research model: Research of Chaudary, Nisar, and Rehman 2014 published in Lahore Journal of Business in the year 2014 indicated that there are six independent variables and on mediating variable which is affecting the impact of these six independent variables on acceptance of Online Sales but when we consider the research paper of Qureshi., Fatima & Sarwar which was published in the Science International Journal of Lahore we came to know that three other independent variables which are creating impact on the acceptance of online. Therefore in the developed model of Factors Affecting Online Sales we have used Nine Independent Variables and one Mediating Variable.

V. RESEARCH MODEL

Research Model highlighting the relationship of the research variable is as under:
Literature Review: Review of literature in order to highlight the relationship of related variables is as under:

Convenience: It is elaborated as the element which saves customers time and efforts during their shopping experience. (Clemes., Gan. & Zhang., 2014) While for online shopping it is treated as the most impactful factor which forces customer to purchase from their home. (Darian., 1987) Researcher indicated that intentions to purchase online or from home increase its velocity due to this factor. (Swiley. & Goldsmith., 2013) The major purpose of motivation is the removal of time constraints related with shopping as well as inclusion of liberty to stay at home during purchase. (To., Lio. & Lin., 2007)

Research work figured out five type of motivation which are major purpose for purchasing online say for example ability to save physical efforts during the shopping experience, liberty to save time associated with the shopping, saving vexation, induction of flexible timing in the shopping procedure, addition of liberty to purchase impulsively and subtraction of elements which can cause discomfort or ambiguity in shopping procedure. (Li., Kuo. & Russel., 1999) While research also identified that customers who shop online are more convenience-oriented rather than experience. (Eggert., 2006)

Research also indicated various reasons due to which consumers choose the online channel includes: 24-hour shopping convenience; the ease to compare prices; free shipping offers; no crowds like in mall/traditional stores; more convenient to shop online; easier to find items online than in stores; better variety online; no sales tax; direct shipping to gift recipients and the ease to compare products. Others are trusted seller status; No tax; online coupon availability; Return policy and Customer loyalty/rewards program. (Janiyo. & Kolapo., 2015)
Perceived Price: Cost sensitive customers are always attracted by availability of products in lesser price levels. While relating this with the online purchase we can state that suitable levels of price associated with company’s offerings forces customer to purchase online. (Childers., Carr., Peek & Carson., 2001) Moreover it is also treated as the factor which can not only influence the customer’s level of retention and results in utter of positive word of mouth but also enhance the attraction as well as hitting rate of the web site in comparison to the others. (Santos., 2003) This is also supported by the research work of 2003 and 2014 as research indicated that choice of customer is dependent upon perceived level of price associated with the specific website. (Chaising. & Dholakia., 2003) As those who believes in shopping online never feel reluctant in comparing price level of products through visiting different websites as this will help customers in taking optimal decision. (Clemes., Gan. & Zhang., 2014)

In recent times there are various options available to customers in form of websites to obtain related information which will make them assure related with price level associated with particular product(s), while this obtained level of price affect the purchase behavior as the customers of online purchase category relate this directly with the utility which they will have through the use of the available item(s) As customers are not supposed to remember the actual price of the product and hence availability of selling prices on websites make it easy for them to remember these in a meaningful way. (Kim., Xu. &Gupta 2012)

Customer Characteristics: It has been indicated through the help of research that there is an association of demographic profile of customers and their online shopping behavior. (Qureshi., Fatima. & Sarwar., 2014) Research indicated that attitude of customer towards the online shopping can be determined by the demographic profile. Research further indicates that gender, awareness, knowledge, socio economic status & living environment all affect customers attitude towards online shopping and we must take into account all of these demographic variables as those which are the creating force towards online purchase. (Sultan. & Henrichs., 2000, & Qureshi., Fatima. & Sarwar., 2014).

Furthermore research also elaborated the meaning of customer’s attitude towards online shopping and indicated that this can elaborated easily as the extent of positive or negative feeling of customer associated with the purchase through internet. (Schllooser., 2003 & Chiu., Lin & Tang., 2005) While the research of year 2005 indicated that gender and house hold income are the factors associated to the demographic profile which have positively associated with the online purchase behavior (Koyuncu. & Battacharya., 2004 & Hansen., 2005) and these finding are also supported by the research work carried out in India. (Richa, 2012)

Variety: It has been observed that online stores always provide more product variety to customers in comparison to those who are business offline. (To. Lio. & Lin., 2007 & Clemes., Gan. & Zhang., 2014) Moreover research also indicates that preference level of customer is also been positively associated with the range of product available on online store. (Sin. & Tse., 2002) As this will help in fulfilling the diverse set of needs associated with online shoppers & therefore researcher found this as one of the most important factor in customer satisfaction who prefer online shopping. (Namjae. & Sanghyuk., 2001) While the other research also supported the findings of the Namje & Sanghyuk that availability of variety in online shopping store is always beneficial for the satisfaction of online shoppers. (Choi. & Loren., 2004)

Customization: It can be defined as the system by which adaptation has been provided to customers. (Chaudary, Nisar, and Rehman 2014) Through internet we have one of the modest method to customize our shopping and being able to customize product specification according to our requirements and preferences. (To. Lio. & Lin., 2007)

Ease of use: As per the literature of prior research work, this variable is treated as the mediating variable in the research settings. (Chaudary, Nisar, and Rehman 2014) and through the review of literature of prior research work it is the limit to which one believes that he/she will be able to work with the program or website with minimal efforts. (Davis., 1989)

Moreover it has been also indicated by the research that the probability of acceptance of any application which is perceived as easy options in comparison to the other remaining options and through linking this with concept of online purchase it has been indicated by the research of 2011 that ease of use is responsible for gathering customer attention for the longer period of time which will results in positive results for purchase. (Chaudary, Nisar, and Rehman 2014)

Information Availability: Researchers indicated that all the information associated with available merchandise, store or sales campaign etc should be covered under the head of information availability. (To. Lio. & Lin., 2007) It is also found through h the review of literature of prior research work that availability of information on particular website also treated as the driver behind the effective decision making of customers. (Clemes., Gan. & Zhang., 2014).

This is also supported by the research work of 2014 and according to the research websites are treated as the storehouse of information which help customers while searching for desired information and also in making appropriate decision making In addition to this internet itself acting as a tool which provide plenty of resources which will help customer in making optimal decision. (Chaudary, Nisar, and Rehman 2014)

Research of 2002 indicated that there are two types of information which might be available to customers through websites namely a) Non-Value added Information and b) Value Added information. While the other research of the same year indicated the availability of value added information the commercially use d website is treated as the major incentive for the online customers and also treated as the major source of diversity. (Wheeler., 2002) as there are huge number of potential customers are available due to the massive use of internet (Jenyo. & Soyoye., 2015) and through the proper use of website coupled with the use of proper value added information company’s can convert these potential customers in the real customers and can also retain them for the longer period of time through enhancing their rate of satisfaction. (Lauran. & Lin., 2003)

Website Factors: As customer demand more control and convenience therefore it is necessary for e-vendors or sellers to modify their websites in order to make customer gain easy access
to their needs, can learn about them easily and also can make their purchase decision with a minimal effort and time. (Chaffey & Smith., 2008) These factors referring towards website design which aids customers in purchase though websites, these factor includes contents and design of website. (Chaudary, Nisar, and Rehman 2014) While research conducted in year 2000 tries to explain these two factors and according to the research content indicates all the information associated with company’s offerings available on website while design is the element which indicates the pattern in which is the formation is displayed through website. (Huizingh., 2000) While research conducted in the year 2001 mark these two factors as the fundamental element for sellers who want to structure their websites properly. (Wolfinbarger, & Gilly., 2001)

Design of website also considered as the important factor for those customer who prefer to purchase online as the poorly designed websites discourage customers intention to perform transaction online. (Chaudary, Nisar, and Rehman 2014) Research work of 2012 showed that the layout of the homepage is one of the major indicators of the customer’s satisfaction. While the availability of other important factors such as characteristics of website associated with technology, product and information along with logical support are the other important factors which are treated as predictive for customer’s satisfaction. (Belch. & Belch., 2008)

While research also investigates variables which are responsible for popularity of commercial websites and found that the most important reason for the increase in the percentage of hit rate of website is the proportion of up gradation of website during in the last three months time. While some other factors like links of website to other websites and availability of feedback section for customers are the other factors which are forcing customers to increase their percentage of visit of the specific website. (Chaffey, & Ellis-Chadwick., 2012)

Trust: Research work conducted in the year 2012 indicated that perception regarding the trustworthiness of any particular seller. (Kim., Yu. & Gupta., 2012) But for instance researcher wants to associate this definition to the context of E-Marketing therefore they defined trust in the context of E-Marketing as the extent to which buyer wants the technology of the website to be credible. (McKnight. & Chervany., 2002) Extending this concept researcher highlighted the point that perceived level of safety associated with the online transaction is the fundamental reason why some of the internet users are not interested in conducting online transactions. (Gefen. & Straub., 2003)

Research also indicated that maintenance of trust especially in the business which require online transactions. (Ha. & Stael., 2009)

Therefore it is appropriate to state that during online purchase customers are assuming greater risk as well as uncertainty which can be minimized through developing their trust on a particular website. (Chaudary, Nisar, and Rehman 2014) Research of 2013 also highlighted that importance of trust in selection of online retailer. (Freathy. & Calder wood., 2003)

While recent research of 2012 also indicated the importance of trust for online business and pointed out that trustworthiness of online vendor is inversely associated with the risk associated with the online business. (Kim., Xu. &Gupta 2012)

Perceived Risk: Research defines this variable as the expected level of negative outcome associated with the purchase decision. (Dunn., Murphy. & Skelly., 1986) Moreover there is a larger amount of risk which is involved in doing business through h E-Commerce in comparison to the traditional way of making purchase. Thus it is found appropriate to state that due to increase in the overall perceived risk the negative impact has been imposed on the attitudes towards online shopping. (Chaudary, Nisar, and Rehman 2014)

While it has been also observed by the research that there is a positive influence of sound security and privacy on the behaviors towards E-Commerce & consumer tends to shop more when they observed these two features are working appropriately. (Clemes., Gan. & Zhang., 2014)

It has been also indicated by the research the level of uncertainty associated with the decision of purchase indicates the level of risk which is perceived by the customer, and there are various types of perceived risks (Hong. & Cha., 2013 & ) which are elaborated here to make literature more complete & through with respect to the research work.

a) Performance Risk: Research conducted in 2013 indicated that there is a considerable amount of performance risk associated with the online purchase. (Hong. & Cha., 2013) As the product in online shopping is non-tangible and hence its evaluation must be done on the availability of minimal level of information. (Chaudary, Nisar, and Rehman 2014)

Prior research work also indicated that there is a natural risk linked with this type of purchase as the product cannot be examined by customer before its purchase. (Bhatnagar., Misra. & Rao., 2000) and hence might discourage some prospects from online purchase. (Chaudary, Nisar, and Rehman 2014) But some of the website adds the feasibility to their customers in form of forums for the purpose of customer interaction and through this feasibility customer can interact with each other and also can record their experience regarding products (Hong. & Cha., 2013) & as indicated by the research the customer tends to reduce product performance risk by purchasing well known brands. (Aghekyan-Simonian., Fireythe., Kwon. & Chattarman., 2012)

b) On-Line Payment Risk: This type of risk is one of the major ingredient over all level of perceived risk which are involved in online purchase, research use various survey reports in support of this argument in order to prove their statement worthy. (Hong. & Cha., 2013) As consumer feel it is insecure to use online payment method if there is a chance of leaking of their confidential information and details of financial instrument might also be exploited. (Chaudary, Nisar, and Rehman 2014)

c) Delivery Risk: The risk associated with the misplacement of purchased items as the in expertise in conducting online business might result in misplacement of products at the time to delivery. (Hong. & Cha., 2013) and consumer who feel that they are going to spend on those items which might
not reach them are reluctant to do online shopping. (Chaudary, Nisar, and Rehman 2014)

d) **Privacy Risk:** Shopping website asks for some sort of private information when customer tried to access them and hence raises the issue that the provided information might be used in an unethical manner, which increases the level of uncertainty at customers end and hence also raises the overall level of perceived risk. (Chaudary, Nisar, and Rehman 2014)

The Methodology of Research: The purpose of this research was descriptive in nature as the data was available through which we have gained the appropriate knowledge regarding various type of variables and their impact upon each other. As we got several researches on our topic of interest therefore by combining the research model of researches we have generated the research model which is Stochastic in nature. The type of investigation we have conducted was Co-Relational and the nature of the experiment was field experiment as we have collected the information from the customers of On-line sales as the places of their convenience. While the interference of the researcher was moderate in nature as we have used the systematic questionnaire to conduct the research.

As the data was collected once therefore the time horizon for the research was Cross Sectional in nature. While the questionnaire is made up of questions based on Likert scale as it is the most appropriate format of questionnaire which was also used by Chudary, Nisar & Rehman for the research on the topic published in Lahore Journal of Business in the year 2014 and for the analysis of data we have used AMOS which is a plug in of SPSS. The Sampling Frame was all the residents of Karachi having some knowledge of Online Sales. While Observed Population for the Research includes residents of porch areas Karachi having some knowledge of Online Sales. The Sampling Type used for the collection of data for this research was Non-Probability Sampling and the Method we used for the collection of data was “Convenience Sampling” and Sample size for the research was 350 respondents. For this purpose we have circulated 400 questionnaires among them 380 were returned and among these 30 questionnaires were rejected on the grounds of inappropriate and incomplete level of information.

As the model has one intervening variable as well as multiple independent variables therefore we use Structural Equation Modeling (SEM) which was also used as the research tool for conducting research by above mentioned researchers. Moreover the mentioned statistical technique is worthy for measuring the impact of independent variables as well as the impact of intervening variable on the relationship of the variables. As we are implementing the AMOS (A Plug-in of SPSS) in order to implement Structural Equation Modeling therefore we have to redevelop the research model through using the software and the redeveloped model is as under:

![Diagram](image-url)
VI. RESULTS AND DISCUSSIONS

As we have used the AMOS as the Plug-In of SPSS therefore the model is self explanatory and explains the relationship of all the variables and indicated that for 1 unit increase in convenience the level of Acceptance of Online sales has been increased by 0.85 units, 1 unit increase in the Perceive level of price the level of Acceptance of Online sales has been increased by 0.48 units, With 1 Unit increase in the Customer Characteristics the level of Acceptance of Online sales has been increased by 0.67 units, With 1 Unit increase in the Level of Customization the level of Acceptance of Online sales has been increased by 0.38 units, With 1 Unit increase in the Information Availability the level of Acceptance of Online sales has been increased by 0.97 units, With 1 Unit increase in the Website Factors the level of Acceptance of Online sales has been increased by 0.27 units, With 1 Unit increase in the Level of Trust of customer the level of Acceptance of Online sales has been increased by 0.87 units and With 1 Unit increase in the Level of Perceived level of Risk the Acceptance of Online sales has been increased by 0.58 units.

While the remaining variable Variety is found to be insignificant and hence its $\beta$ value has not been indicated and it does not creates significant impact on the acceptance of online shopping. In addition to all this Ease of Use which is the mediating Variable with respect to the research model and there is no requirement to check its impact in association with the independent variables, but there are some limitations also there which are creating hindrance to the evaluation process. Therefore we have checked its impact in association with only one independent variable that is convenience and the mediating variable in association with the mentioned independent variable manipulates the impact of it on the dependent variable as shown it enhances the impact of the IV and makes its impact up to eighty five and half this means with the presence of mediating variable convenience 1 unit increase in the convenience increases the acceptance of online banking by 85.5 units.

Area for Future Research: We have conducted this research in the areas of Karachi only and with the sample of under 400, therefore it has been suggested that research which compares the acceptance of more than one city or province will enhance the knowledge and research which inclined towards the exploration of demographic factors in this regards will be further importance in the case.

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Study of the antimicrobial effect of the protein fraction isolated from germinated *Vigna radiata* (Mung bean) seeds

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Abstract- Antimicrobial proteins (AMPs) are widely distributed in nature. In higher eukaryotes, AMPs provide the host with an important defense mechanism against invading pathogens. AMPs of lower eukaryotes and prokaryotes may support successful competition for nutrients with other microorganisms of the same ecological niche. AMPs show a vast variety in structure, function, antimicrobial spectrum and mechanism of action. Most interestingly, there is growing evidence that AMPs also fulfill important biological functions other than antimicrobial activity.

The present study aims at isolation and determination of antimicrobial properties of common leguminous plant, *Vigna radiata* (Mung bean) which will develop some novel aspects for their future use in medicine, agriculture and biotechnology. In higher eukaryotes, AMPs provide the host with an important defense mechanism against invading pathogens. Since Leguminous plants (Family: Fabaceae) proteins have strong pharmacological impacts, thus, the study was emphasized on *Vigna radiata* (Mung bean) in order to isolate and purify the protein and to evaluate the antimicrobial activity of the same against dreadful pathogens.

II. MATERIALS AND METHODS

Protein extraction

The leguminous seeds of *Vigna radiata* were collected from the local markets of Uttarakhand. The modified strategy used for protein extraction [8] is described in the following steps-

- Seeds were washed with HgCl₂ and further taken for the study (10g-100 g)
- Crushed and blended with 150 ml of PBS at 4°C.
- Frozen and thawed 3-4 times.
- Supernatant fractions were subjected to 75% ammonium sulphate precipitation while pellet fractions were discarded.
- Further centrifugation (10, 000 rpm for 1 hour at 25°C) of the ammonium sulphate precipitated fractions was done to obtain the pellet.
- The pelleted fraction was solubilized in deionized water and will be followed for dialysis and SDS PAGE.
- Further Gel-column chromatography of the pellet fractions was performed in order to obtain the pure crude fractions.
- Furthermore SDS-PAGE analysis of the crude fractions eluted was performed.

Column Gel Chromatography of eluted protein fractions

About 2 ml having ~500 μg/ml protein concentration of this sample was applied onto the 1.5 x 70 cm column of
Sephadex G-100 pre-equilibrated with 0.02M Sodium acetate buffer (pH 4.5). The column was eluted with the same buffer at the rate of 1ml/1min. The elution pattern was monitored by taking absorbance of collected fractions at 280 nm [9].

**SDS-PAGE analysis of eluted protein fractions & Quantitative estimation by Folin - Ciocalteau’s reagent**

The fractions along with crude extract and solubilized ammonium sulphate precipitated protein were run on sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) using 12% - 14% gel by method described [10]. The gels were stained with coomassie brilliant blue R-250 and destained with methanol: acetic acid: water (30:60:10 v/v). The approximate molecular weight of fractions activity was determined by plotting Rf versus molecular weight of known standard proteins. Protein fractions isolated and purified from seeds was determined [11]. Absorbance was measured at 750 nm in UV-VIS spectrophotometer.

**Determination of Antimicrobial activity**

**Culture Media**

For antibacterial test, Soyabean Casein Digest agar/broth and Sabouraud’s dextrose agar/broth of Hi Media Pvt. Bombay, India was used for antifungal test.

**Inoculum**

The bacteria viz. *Bacillus subtilis*, *Bacillus licheniformis*, *Pseudomonas aeruginosa* and *Lactobacillus* sp. were inoculated into Soyabean Casein Digest broth and incubated at 37 °C for 18 h and suspension was checked to provide approximately, 10⁵ CFU/ml. The same procedure was done for fungal strains viz. *Aspergillus niger* and *Cladosporium cladosporioides* and these strains were inoculated into Sabouraud’s dextrose broth but the fungal broth cultures were incubated at 48-72 h.

**Determination of diameter of zone of inhibition by well diffusion method**

The agar well diffusion method [12] was modified. Soyabean casein digest agar medium (SCDM) was used for bacterial cultures. The culture medium was inoculated with the bacteria separately suspended in nutrient broth. Sabouraud’s dextrose agar/broth will be used for fungal cultures. The culture medium was inoculated with the fungus separately suspended in Sabouraud’s dextrose broth. A total of 8 mm diameter wells were punched into the agar and filled with protein extracts prepared in N-saline at different concentrations viz. 0.5, 1.0, 1.5, 2.0 and 2.5 mg/ml to determine the antimicrobial potential of the protein extract. The antimicrobial activity was performed against *Bacillus subtilis*, *Bacillus licheniformis*, *Pseudomonas aeruginosa* and *Lactobacillus* sp., *Aspergillus niger* and *Cladosporium cladosporioides*.

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**Figure 1:** Protein fractions purified from *Vigna radiata* (Mung bean) seeds by Gel chromatography.

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Figure 2: SDS PAGE of the protein fraction purified from *Vigna radiata* (Mung bean) seeds

Table 1: Antimicrobial activity of the eluted protein fraction against selected pathogens
Figure 3: Variability pattern of antimicrobial protein fraction purified from seeds of *Vigna radiata*
Figure 4: Zone of inhibition measured of the isolated protein and positive controls against different pathogens
The Relationship Between Strategic Competence And Business Performance Of Graduates With Physical Challenges In Kenya

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I. ABSTRACT
The purpose of this research was to analyze the relationship between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County in Kenya. The research objective was to establish whether Strategic Competence had any significance in Business Performance. The hypothesized relationship was being moderated by Business External Environment with its constructs being Access to Finance and Location of Business. Participants of the study were graduates of higher education and training with physical challenges owning and managing businesses in Kiambu County in Kenya. These participants have had training at higher education and training institutions such as universities and tertiary level colleges. The institutions being Public and Private Universities, Technical Training Institutes, Institutes of Technologies and other private and commercial colleges. The physical challenges in focus included mobility impairments categorized as acquired or congenital that may or may not require the use of assistive devices. The study was longitudinal and utilized a descriptive-survey method. It was largely quantitative in nature and triangulated by some qualitative aspects. It addressed a population of 480 businesses owned and run by graduates with physical challenges of higher education and training in various constituencies within Kiambu County in Kenya. Businesses included in the study were selected through simple random sampling method. A sample of 172 respondents was picked. To collect primary data structured questionnaires were used which contained closed and open-ended questions. Secondary data was collected using relevant literature, records from the Ministry of Labour Kiambu County, NCPWD office and records from selected higher institutions of learning. Pilot test was carried out on a sample of 17 persons with similar characteristics as those in the final study. To access discriminant validity, correlations among indicators and constructs was deployed. Reliability was assessed using Cronbach’s Alpha. Data was statistically analyzed (descriptive analysis F-tests and t-tests) through applying the SPSS Statistics 17.0 software.

Index Terms- Strategic Competence, Physical Challenges, Entrepreneurial Skills, Business Performance.

II. INTRODUCTION
According to Bird (1995), entrepreneurial competencies are defined as individual’s traits, such as specific knowledge, motives, features, self-images, social roles and abilities which result in venture success. Entrepreneurial competencies are related to the performance of the firm and its competitiveness (Man et al., 2002), growth and success of business (Colombo &Grilli, 2005). These competencies are also associated with birth, survival and venture growth. Entrepreneurship is one of the fundamental drivers of innovation, competitiveness, and economic growth for both developed and developing countries and serves as a social inclusion for minority groups for instance persons with disabilities and immigrants Pavey (2006). Entrepreneurship as a field does not lock out persons with disabilities (PWDs) since it is the only area that one can imprint their own creativity and enjoys the full benefits of flexibility on time. Entrepreneurship plays an important role in the society not just because entrepreneurs create jobs but because at the end of the day, it is not just about business, it is about people having the freedom to express their creativity, to imprint their style on the work they do, to turn their knowledge, skills and abilities into their own businesses, to create flexibility around their life conditions and personal interests and to make employment choices over which they have more control Jones & Latreille (2005); Bwisa (2011). Therefore, an entrepreneur with disability ought to demonstrate that being
disability can facilitate the exploitation of opportunities that previously had been unexploited Shane and Venkataraman (2000). This is in line with the indications that entrepreneurship may bring a number of positive personal, social and financial benefits to persons with disabilities.

Persons with disabilities may have a greater tendency to be self-employed than persons without disabilities (Boyland & Burchardt, 2002; United States Office of Disability Employment Policy, 2001). The use of self-employment as a means of improving the living standards of persons with disabilities is promising for some reason; it is probable that persons with disabilities who become entrepreneurs will be more likely to hire persons with disabilities, as opposed to entrepreneurs who do not have a disability or other traditional employers ILO (2007). This has been seen on other disadvantaged groups, such as African Americans in the United States (Sinh, Knox & Crump, 2008). As such, resources expended promoting persons with disabilities to enter into entrepreneurship may have greater benefits to the entire persons with disabilities population than those expended promoting regular employment ILO (2007).

In Kenya, as in many countries in the region and globally, entrepreneurship is viewed as a core strategy for enhancing the ability to create employment, innovation and wealth RoK (2010), thus the 21st century competencies have been defined as the skills, knowledge and attitudes needed in order to compete in the global marketplace. Kenya has a large population of physically challenged persons who have shown great interest in entrepreneurship by engaging in owning, managing and running enterprises (Kenya National Survey on Persons with Disabilities 2008). Entrepreneurship plays a major role in helping disadvantaged person in society break away from their unprivileged positions (Alvord et al., 2004), serves as a potential device for poverty alleviation (Bornstein 2004), a solution to unemployment and discrimination in the labor market (Fairlie 2005) or a tool for social inclusion of minority groups (Pavey 2006). The United Nations Convention on the Rights of Persons with Disabilities UNCRPD (2007) states that persons with disabilities include those who have long-term physical, mental, intellectual and sensory impairment which in interacting with different barriers may hinder their full and effective participation in society on an equal basis with others. In general disability is referred to as whole or partly, inability of individual to perform ordinary activities of life due to congenital or acquired defect in physical or mental strength Karimi et al., (2014). Persons with mobility limitations (which refer to the ability to move) may have lost arms, hands, feet or legs due to amputation or congenital problems IDDC (2012). Mobility impairments can result from medical conditions such as arthritis, multiple sclerosis, cerebral palsy, spina bifida, diabetes, muscular dystrophy and paraplegia. There are varying degrees of mobility impairments. People with mobility impairments may use assistive devices which may include wheelchairs, or aids such as crutches (elbow or arm-pit), canes or walkers to help overcome mobility obstacles WHO (2013).

The most common cited objectives of entrepreneurship education are to demonstrate positive attitude towards self-employment; identify viable business opportunity, portray a desire to venture into business, demonstrate managerial skills for running a successful business enterprise, apply managerial competencies in business situation; understand the factors likely to affect the success of a business, to encourage new start-ups and other entrepreneurial ventures Thomas et al., (1994); Nteere (2013). According to Bwisa (2014) entrepreneurship education seeks to prepare the learners to become entrepreneurial thinkers and contribute to economic development and sustainable communities. It is not just about teaching someone to run a business as mainstream business courses do. Its core objective is to encourage creative thinking and promote strong sense of self-worth Bwisa (2011). Through entrepreneurship education, students learn how to create a different and a better business. The core knowledge created by entrepreneurship education includes, but not limited to; the ability to recognize opportunities in one’s life; ability to pursue such opportunities by generating new innovative ideas and marshalling needed resources; ability to create and operate an innovative new venture; and finally the ability to think in a creative and critical manner (Bwisa 2014).

Entrepreneurship education is supposed to instill knowledge, skills and attitudes thus, it can be used to make a person more competent and a more professionalized business owner. However, all entrepreneurs are business people but not all business people are entrepreneurs (Bwisa, 2011). An entrepreneur is an individual who creates something new with value by devoting the necessary time and effort, assuming the accompanying financial, psychic and social risks and receiving the rewards of monetary and personal satisfaction and independence (Hisrich, Peters & Shepherd, 2009).

III. RESEARCH ELABORATIONS

Statement of the problem

Kenya, just like other countries of the world has some of her citizens being persons living with disabilities. The Population Census 2010 officially reported that 3.5 per cent of the population or 1,330,312 is comprised of persons with disabilities (RoK 2010), among these only 1 per cent is formally employed. The country has been practicing inclusive education since the turn of the century and this has seen the country achieve great milestones in education. The country has a large population of physically challenged people who have shown great interest in entrepreneurship by engaging in owning, managing and running enterprises (Kenya National Survey on Persons with Disabilities 2008); Bwisa & Margaret (2013).

Whilst entrepreneurial competencies are important for all Small and Medium Enterprises (SMEs), the imperative to develop the understanding of such competencies in the context of physically challenged-persons-led businesses is of importance Bwisa et al., 2013). There are growing numbers of self-employed persons with physical disabilities in developing economies such as Kenya and many of these businesses are highly dependent on the owner and his or her skills Mpofu (2012).
There is evidence that majority of the physically challenged persons operate traditional businesses associated with low income; they lack the necessary entrepreneurial competencies to operate high performing enterprises thus leading to the poor performance in business Bwisa & Margaret (2013). From the information attained at NCPWD office in the Ministry of Labour in Kiambu County in Kenya, persons with disabilities are issued with mobility devices, business loans as well as business kits to help them startup own businesses. The greater percentages of the beneficiaries are those who sell these devices while others opt not to use them for reasons well known to individual persons. The question that the researcher asks is, why do physically challenged persons-led businesses perform poorly in Kiambu County in Kenya? Could the failure be paralleled with lack of entrepreneurship education? Could the presence or absence of entrepreneurial competencies explain this? This research therefore sought to find out whether graduates with physical challenges of higher education and training -where entrepreneurship education is a basic course in the curriculum; possess entrepreneurial competencies that lead to better performance in business.

**Strategic competence and Business Performance**

Strategic competencies are related to setting, evaluating and implementing the strategies of the firm Lau et al., (2000). In SMEs, the critical resources are likely to be held by the individual entrepreneurs that are reflected in their skills, knowledge, abilities, experience and education. Being the key decision makers, the entrepreneurs have high influence on the formation of business strategy and are responsible to set the roadmap for their firms to move towards the set goals. The lack of separation between ownership and control in small firms suggests that the business owners themselves are responsible for the direction and the development of their firms Vijay et al., (2011).

Being the owner of the firm, the entrepreneur must set the direction for the whole company. This category of competencies require the entrepreneur to have a vision or a big picture in their mind for their business, to have clear goals to achieve, or to formulate and implement strategies to achieve these visions and goals Lau et al., (2000). In essence, these competencies are necessary for better performance in businesses run by persons with physical challenges and they are related to setting, evaluating and implementing the strategies of the firm, while calling for abilities and skills from a broader and long-term perspective.

Components of Strategic Competence in the research called for the owner to have a vision for the business, have the ability to set short and long-term goals as well as evaluate these goals. Making strategic changes whenever the business called for such as well as use of tactics as the owner establishes their space in business. All these strategies could not come to fruition if owners of businesses did not develop budgets for strategy to make it easier to control and evaluate their strategic outcome.

**Research Design**

The study employed descriptive-survey approach method. This design was suitable for the study as it sought to describe the relationship between Strategic Competence and Business Performance of graduates with physical challenges of higher education and training. The study was largely quantitative in nature and was triangulated by some qualitative aspects.

Quantitative research methods included multiple linear regression model whose coefficients were tested using Analysis of Variance (ANOVA) for overall model significance. Qualitative research method included content analysis where issues emerging from the key open ended questions would be clustered into thematic areas upon which interpretations and conclusions were drawn. Correlation research design was also used to measure the relationship between two variables. According to Kothari (2007) simple correlation assumes there is a linear relationship between two variables.

Normality of distribution was analyzed using the Kolmogorov Smirnoff Test otherwise known as CKS Test to check whether the dependent variable was normal or not, thus, deducing the statistical significance leading to either reject or fail to reject the outcome. The Gaussian distribution is one of the methods used to determine how well the data is distributed. Lapa et al., (2012) notes that in order to fit a linear model, the dependent variable has to be normally distributed. Q-Q plots and the Kolmogorov-Smirnov (KS) test were used to confirm normality in this study.

**Sampling Frame**

A sample frame is a complete list in which each of the unit of analysis is mentioned only once (Kerlinger & Lee, 2000). In this study, a sample frame was drawn from accessible population of 480 businesses owned and run by graduates with physical challenges with a university degree, a diploma or a certificate course. According to Nicholas (2011) it is impossible to do a random sampling on a population without a sampling frame unless the population is extremely small. The sampling frame in this study was done from information given by the National Council for Persons with Disabilities (NCPWD) office in Kiambu County in Kenya.

**Sampling Technique**

Simple random sampling technique was used to select the businesses owned by graduates with physical challenges of higher education and training that would be included in the research. Black (2004) defines simple random sampling as a sampling method in which each member of the population has an equal and known chance of being selected. This method was applied because it is simple, easily applied to a small population and ensures there is no bias. At the point of choosing specific category of businesses to be included in the research, purposeful sampling was used to distinguish between businesses run by persons with physical challenges with higher qualifications in education and training from those that had only basic education.

**Data Collection Instruments**

The study used both primary and secondary data. Primary data was collected by the use of assessment tools which assess entrepreneurial mindsets, attitudes and competencies developed by ASTEE team. These concepts are complicated to observe which makes them difficult to measure. The term latent construct is generally used for such variable that cannot be measured directly and
cannot be fully captured by a single question Ullman (1996). Therefore, in order to develop a suitable measurement tool, a single variable needs to be captured through multiple questions representing the variable. However, the indicators of entrepreneurial competencies must be established first. The questions in the survey were a combination of validated constructs and constructs developed by the researcher. The development of the measurement tools has been pre-studied and pilot tested in order to increase precision, validity and reliability of the measurement tools, as well as making them more parsimonious. This research also utilized the use of questionnaires to collect data. Brown (2001) states that questionnaires are any written instruments that present respondents with a series of questions or statements to which they are to react either by writing out their answers or by selecting from among existing answers. It yields to quantitative data and due to provision for open-endedness; the instrument may be used to generate qualitative and exploratory data, Dornyei (2007).

IV. RESEARCH FINDINGS

Table 1: Reliability Results for Strategic Competence

<table>
<thead>
<tr>
<th>Component Matrix</th>
<th>Component 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan ahead of time about solving anticipated problems as well as tackling opportunities</td>
<td>.638</td>
</tr>
<tr>
<td>Know the projected direction of the industry and how changes might impact on my business</td>
<td>.551</td>
</tr>
<tr>
<td>Am very often the first to introduce new products/services as compared to my competitors</td>
<td>.739</td>
</tr>
<tr>
<td>Strictly follow my laid down goals In whatever I undertake to do in my business.</td>
<td>.623</td>
</tr>
<tr>
<td>My short-term goals or day-to-day tasks are in line with my long-term goal.</td>
<td>.723</td>
</tr>
<tr>
<td>Weigh the costs and benefits that I intend to get In every action that I undertake in my business.</td>
<td>.667</td>
</tr>
<tr>
<td>Evaluate results against my strategic goals.</td>
<td>.699</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Reliability Statistics

<table>
<thead>
<tr>
<th>Cronbach's Alpha</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>.770</td>
<td>7</td>
</tr>
</tbody>
</table>

To test the first null hypothesis (H01) that stated that, there is no significant relationship between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County in Kenya, a reliability test was conducted on table 1 that gave a Cronbach’s Alpha Coefficient of .770 indicating the measures were reliable since they were more than .700. The measurements were therefore regarded as moderately good.
Factor Rating on Strategic Competence

Table 2: Factor Rating on Strategic Competence

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Issue</th>
<th>S.D %</th>
<th>D %</th>
<th>N.S %</th>
<th>A %</th>
<th>S.A %</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Plan ahead of time about solving anticipated problems as well as tackling opportunities</td>
<td>5.7</td>
<td>13.0</td>
<td>7.3</td>
<td>52.8</td>
<td>21.1</td>
<td>3.71</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td>b</td>
<td>Know the projected direction of the industry and how changes might impact on my business</td>
<td>5.7</td>
<td>24.4</td>
<td>6.5</td>
<td>48.8</td>
<td>14.6</td>
<td>3.42</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td>c</td>
<td>Am very often the first to introduce new products/services as compared to my competitors</td>
<td>8.9</td>
<td>30.9</td>
<td>13.0</td>
<td>32.5</td>
<td>14.6</td>
<td>3.13</td>
<td>3.00</td>
<td>4</td>
</tr>
<tr>
<td>d</td>
<td>Strictly follow my laid down goals In whatever I undertake to do in my business.</td>
<td>2.4</td>
<td>11.4</td>
<td>1.6</td>
<td>60.2</td>
<td>24.4</td>
<td>3.93</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td>e</td>
<td>My short-term goals or day-to-day tasks are in line with my long-term goal.</td>
<td>3.3</td>
<td>7.3</td>
<td>7.3</td>
<td>56.9</td>
<td>25.2</td>
<td>3.93</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td>f</td>
<td>Weigh the costs and benefits that I intend to get In every action that I undertake in my business.</td>
<td>0.8</td>
<td>2.4</td>
<td>4.1</td>
<td>61.0</td>
<td>31.7</td>
<td>4.20</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td>g</td>
<td>Evaluate results against my strategic goals. TOTAL</td>
<td>2.4</td>
<td>10.6</td>
<td>5.7</td>
<td>53.7</td>
<td>27.6</td>
<td>3.93</td>
<td>4.00</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>123</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The rating on Strategic Competence issues on a five point Likert scale indicates that majority of respondents agreed that Strategic Competence affects Business Performance of graduates with physical challenges with the issue, “strictly follow my laid down goals in whatever I undertake to do in my business” recording a highest frequency value of 74 (60.2 per cent), and the issue, “I am very often the first to introduce new products/services as compared to my competitors” scoring the lowest response with a frequency value of 40 (32.5 per cent). Table 2 reports these findings. Majority of respondents believed that they were following their laid down objectives however, a frequency value of 14 (11.4 per cent) disagreed that they strictly followed laid out goals in whatever they undertook in their businesses.

A number of respondents confirmed that they did not plan ahead of time with 7 respondents (5.7 per cent) strongly disagreeing while 16 respondents (13.0 per cent) disagreed. Moreover, 9 respondents (7.3 per cent) were not sure whether they planned ahead of time. This could be attributed to the poor performance in business. Respondents having a frequency value of 30 (24.4 per cent) disagreed that they knew the projected direction of the industry and how changes could impact on their businesses. “Am very often the first to introduce new products/services as compared to my competitors”, the response rate was worrying because a frequency value of 38 (30.9 per cent) disagreed; 11 (8.9 per cent) strongly disagreed and, 16 (13.0 per cent) were not sure. A total frequency value of 65 (52.8 per cent), that is, more than half of the respondents did not come up with new products or services. Majority of respondents reported that they had well laid down strategies that could enable them to sell more than their competitors, for instance, not compromising on quality of their goods or services, advertising their products or services, selling at a value pricing, outsourcing products, and ensuring there are new products in the business. This competence field was anchored on the theory of Resource Based View that addresses a firm as possessing specific and valuable competencies that are immobile and heterogeneous in order to have a sustainable competitive advantage.
Among the objectives of the study was to assess the relationship between Strategic Competency and Business Performance of graduates with physical challenges in Kiambu County in Kenya. The figure above indicates that there was a positive linear relationship between Strategic Competence and Business Performance with a positive gradient of 1.344 (see Table 6). It shows a positive gradient indicating that Strategic Competence had an influence on Business Performance. The second quadrant of the line of best fit has the most plots crowded showing an estimate line that is positively increasing. A few outliers are present in the scatter plot and most plots are concentrated at the upper right side. This implies that increased Strategic Competence led to increased performance and the opposite is true that a decrease in Strategic Competence would lead to poor Business Performance. A conclusion was reached at that Strategic Competence is vital for any business to perform optimally. This led to the rejection of the fifth null hypothesis that, there was no significant relationship between Strategic Competence and Business Performance, therefore, concluded that the relationship existed.

Correlation analysis between Strategic Competence and Business Performance constructs was conducted. Table 3 depicts this relationship with a coefficient value of .685 showing a statistically significant positive linear relationship between Strategic Competence and Business Performance. It was concluded that Strategic Competency was the best predictor of Business Performance. This is the ability to systematically plan how to meet short and long-term goals through developing plans which anticipates obstacles and evaluates alternative tasks by taking logical and systematic approach to activities. This is also being able to identify new and potentially unique ideas to reach goals and allow one to switch to alternative strategies.
Regression Analysis

Table 4: Model Summary of Strategic Competence versus Business Performance

<table>
<thead>
<tr>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
</tr>
<tr>
<td>.685</td>
</tr>
</tbody>
</table>

Predictors: (Constant), STRATEGIC COMPETENCE

From table 4, the regression model on Strategic Competence versus Business Performance, the coefficient of determination R square is .469 and R is .685 at 0.05 significance level. The coefficient of determination indicates that 46.9% of the variations on Business Performance is explained by Strategic Competence. This implies that there exists a positive relationship between Strategic Competence and Business Performance. Strategic Competence was considered as the best predictor of Business Performance among the subjects of the research study.

Table 5: Analysis of Variance between Strategic Competence versus Business Performance

ANOVA

<table>
<thead>
<tr>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>404.659</td>
<td>1</td>
<td>404.659</td>
<td>106.738</td>
</tr>
<tr>
<td>Residual</td>
<td>458.731</td>
<td>121</td>
<td>3.791</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>863.390</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors: (Constant), STRATEGIC COMPETENCE

Dependent Variable: BUSINESS PERFORMANCE

From table 5, the Analysis of Variance results on Strategic Competence versus Business Performance for the regression coefficient indicates that the significance of the F value, 106.738, is 0.000 which is less than 0.05 implying that there is a significant relationship between Strategic Competence and Business Performance.

Table 6: Regression Coefficients of Strategic Competence versus Business Performance

Coefficients

<table>
<thead>
<tr>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>6.611</td>
</tr>
<tr>
<td>STRATEGIC COMPETENCE</td>
<td>1.344</td>
</tr>
</tbody>
</table>

Dependent Variable: BUSINESS PERFORMANCE

Table 6, represents the regression coefficients of Business Performance and Strategic Competence. The coefficient of Strategic Competence is 1.344 implying a positive and significant influence on Business Performance. A single unit change in Strategic Competence increases Business Performance by 1.344 units. The fitted model Y=6.611+1.344*X shows that even when Strategic Competence is non-existent, Business Performance is still positive at 6.611 indicating that there are other drivers of Business Performance.
Moderation between Strategic Competence and Business External Environment

Table 7: Coefficients of Strategic Competence and Business Performance

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>(Constant)</td>
<td>6.611</td>
<td>.927</td>
</tr>
<tr>
<td>STRATEGIC COMPETENCE</td>
<td>1.344</td>
<td>.130</td>
</tr>
</tbody>
</table>

Dependent Variable: BUSINESS PERFORMANCE
The study showed that Strategic Competence predicted Business Performance with a coefficient 1.344 and p-value .000 (see Table 7). A constant coefficient of 6.611 meant that even without the Strategic Competence in the picture, Business Performance could be influenced by other variables up to 6.611 units. These variables could be other competencies that formed the independent variables that the researcher had hypothesized; or other factors that were not included as research variables referred to as the “error term” and symbolized as (ε) in statistical models.

Table 8: Model Summary of Strategic Competence and Business External Environment

Model Summary

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>.994</td>
<td>.989</td>
<td>.988</td>
<td>1.75453</td>
</tr>
</tbody>
</table>

Predictors:
STRATEGIC_COMPETENCE, BUSINESS_EXTERNAL_ENVIRONMENT

From Table 8, the coefficient determination of R square is .989 and R is .994 at .005 significance level. The coefficient of determination indicates that 98.9% of the variations on Business External Environment is influenced by Strategic Competence. This implies that there exists a positive relationship between Strategic Competence and Business External Environment.

Table 9: Analysis of Variance between Strategic Competence and Business External Environment

ANOVA

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>32037.710</td>
<td>3</td>
<td>10679.237</td>
<td>3469.121</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>369.404</td>
<td>120</td>
<td>3.078</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32407.114</td>
<td>123</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predictors:
STRATEGIC_COMPETENCE, BUSINESS_EXTERNAL_ENVIRONMENT

Table 9 above shows an F value of 3469.121 at 0.000 significance level which is less than 0.05 implying that there is a significant relationship between Strategic Competence and Business External Environment.
A correlation analysis between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County revealed that Strategic Competence affects Business Performance of graduates with physical challenges in Kiambu County. The correlation findings of .685 denoted a considerably strong and positive linear relationship between Strategic Competence and Business Performance. This so far was the greatest correlation that existed among the competencies of the research study.

Moreover, it had greater significance compared to the relationship between the other competencies and Business Performance. It indicated that when Strategic Competence increased, Business Performance also increased. This eventually led to discarding the null hypothesis that there is no significant relationship between Strategic Competency and Business Performance of graduates with physical challenges in Kiambu County.

The lack of separation between ownership and control in small firms suggests that business owners themselves are responsible for the direction and the development of their firms Vijay et al., (2011). Persons forming a business venture are responsible for its success or failure. If one gets an unfavorable location, it is solely his or her responsibility to make the decision whether to stick or to move to a more favorable location. It is also one's decision to decide to ask for assistance from financial institutions or to get it from one's chamas (small groups based on contributions of money), well-wishers, sponsors, donors or even family and friends.

Regression analysis between Strategic Competence and Business Performance gave a coefficient of 1.344 and a p-value .000. The coefficient determination of R square was .989 and R was .994 at 0.05 significance level and F=3469.121. When Strategic Competence was regressed with Business External Environment and the interaction term of Strategic Competence and Business External Environment as predictors of Business Performance, the coefficient of this interaction was found to be p-value .043 which was significant since it was less than p-value 0.05. This meant that Business External Environment had a significant moderating effect on the relationship between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County in Kenya. Business External Environment constructs being Business Location and Access to Finance contributed greatly to the ability to set one’s roadmap for their business in order to move towards the set goals.

The lack of separation between ownership and control in small firms suggests that business owners themselves are responsible for the direction and the development of their firms Vijay et al., (2011). Persons forming a business venture are responsible for its success or failure. If one gets an unfavorable location, it is solely his or her responsibility to make the decision whether to stick or to move to a more favorable location. It is also one’s decision to decide to ask for assistance from financial institutions or to get it from one’s chamas (small groups based on contributions of money), well-wishers, sponsors, donors or even family and friends.

When Strategic Competence (X) was regressed with Business External Environment (Z) and the interaction term of Strategic Competence and Business External Environment (X, Z) as predictors of Business Performance (Y), (see Table 10) the coefficient of this interaction was found to be p-value .043 which was significant since it was less than p-value 0.05. This meant that Business External Environment had a significant moderating effect on the relationship between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County in Kenya. Business External Environment constructs being Business Location and Access to Finance contributed greatly to the ability to set one’s roadmap for their business in order to move towards the set goals.

The lack of separation between ownership and control in small firms suggests that business owners themselves are responsible for the direction and the development of their firms Vijay et al., (2011). Persons forming a business venture are responsible for its success or failure. If one gets an unfavorable location, it is solely his or her responsibility to make the decision whether to stick or to move to a more favorable location. It is also one's decision to decide to ask for assistance from financial institutions or to get it from one’s chamas (small groups based on contributions of money), well-wishers, sponsors, donors or even family and friends.

Regression analysis between Strategic Competence and Business Performance gave a coefficient of 1.344 and a p-value .000. The coefficient determination of R square was .989 and R was .994 at 0.05 significance level and F=3469.121. When Strategic Competence was regressed with Business External Environment and the interaction term of Strategic Competence and Business External Environment as predictors of Business Performance, the coefficient of this interaction was found to be p-value .043 which was significant since it was less than p-value 0.05. Therefore, it was concluded that Business External Environment did moderate the relationship between Strategic Competence and Business Performance of graduates with physical challenges in Kiambu County.

### V. CONCLUSIONS

H06: There is no significant relationship between Strategic Competency and Business Performance of graduates with physical challenges in Kiambu County in Kenya.

A correlation analysis between Strategic Competence and Business Performance constructs was conducted and a coefficient value of .685 was arrived at showing a statistically significant strong positive linear relationship between Strategic Competence and Business Performance. This indicated that when Strategic Competence increased, Business Performance increased as well. This eventually led to discarding the null hypothesis and confirmed the existence of the relationship. The Cronbach’s Alpha coefficient of Strategic Competence was .770 indicating that the measures were reliable. Majority agreed with the issue “strictly follow my laid down goals in whatever I undertake to do in my business” recording a frequency value of 74 (60.2 percent). The coefficient determination of R square was .469 implying that 46.9 percent of variations on Business Performance were explained by Strategic Competence. The significance of Strategic Competence was 0.000 which was less than 0.05 implying that there was a significant relationship between...
Strategic Competence and Business Performance. The coefficient of Strategic Competence was 1.344 implying a positive effect on Business Performance. A single unit change in Strategic Competence increased Business Performance by 1.344 units.

Strategic Competencies are related to setting, evaluating and implementing the strategies of the firm Lau et al., (2000). In SMEs, the critical resources are likely to be held by the individual entrepreneurs that are reflected in their skills, knowledge, abilities, experience and education. Being the key decision makers, the entrepreneurs have high influence on the formation of business strategy and are responsible to set the roadmap for their firms to move towards the set goals. The lack of separation between ownership and control in small firms suggests that the business owners themselves are responsible for the direction and the development of their firms Vijay et al., (2011). Being the owner of the firm, the entrepreneur must set the direction for the whole company. This category of competencies require the entrepreneur to have a vision or a big picture in their mind for their business, to have clear goals to achieve, or to formulate and implement strategies to achieve these visions and goals Lau et al., (2000).

Majority of the interviewed respondents admitted to having been able to view their businesses in a broader picture as well as setting a clear road map. They had visions and set goals for their businesses which they hoped to attain. Majority were able to achieve short term goals like replenishing products on time and ensuring they kept their competitors on their toes whereas, a good number had no set goals. Majority were able to come up with strategies of selling goods that were not moving as fast as possible, for instance, through rebranding or lowering their prices. Respondents in transport business were able to venture in new routes as well as taking advantage of importing vehicles tax free which is a fair consideration to persons with disabilities by the government of Kenya.

**Entrepreneurial Recommendations**

Financial skills and capabilities are vital for every small business in order to record any growth and expansion. Most of the respondents in the research had scarce knowledge in the manner of handling finances to an extent that some did not know whether they were making profits or not. The stakeholders as well as the business owners should make effort to acquire the necessary financial skills for better performance. The findings of the study also showed that goal setting was a major setback and meeting the set personal goals among the respondents was minimal, therefore, persons with physical challenges need training in this area.

**Policy Recommendations**

A policy implication emanating from the study is that there is need for stakeholders involved in promoting entrepreneurship among the disadvantaged minorities such as the Government, Non-Governmental Organizations, and Disabled People’s Organizations to introduce special programs that will promote entrepreneurship and embrace entrepreneurial spirit and behavior with the goal of improving business performance. Such programs range from training, better financing from financial institutions such as having special loans tailor-made for persons with disabilities with different interest rates from the market rate (current interest rates at the Central Bank of Kenya is 13.5%) thus, disabled people should enjoy a much lesser rate; have a platform in the mass media, both electronic and print for marketing products and services offered by persons with disabilities; basically allowing a person with disability to access the market with ease. Let the structures in place (whether legal or physical) that are obstructive be removed and allow Persons with Disabilities free access to the market.

**Area for Further Research**

The researcher only dealt with physical impairment (mobility defects) and did not delve into other forms of impairments such as hearing impairment, visual impairment and intellectual impairment. Research should be carried out to establish the entrepreneurial capabilities among these groups. It would be very interesting to compare the results.

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Beneficial Reuse of Waste Foundry Sand in Concrete

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I. INTRODUCTION

1.1-SYNOPSIS

Metal foundries use large amounts of the metal casting process. Foundries successfully recycle and reuse the sand many times in a foundry and the remaining sand that is termed as foundry sand is removed from foundry. This study presents the information about the civil engineering applications of foundry sand, which is technically sound and is environmentally safe. Use of foundry sand in various engg. applications can solve the problem of disposal of foundry sand and other purposes.

Foundry sand consists primarily of silica sand, coated with a thin film of burnt carbon, residual binder (bentonite, sea coal, resins) and dust. Foundry sand can be used in concrete to improve its strength and other durability factors. Foundry Sand can be used as a partial replacement of cement or as a partial replacement of fine aggregates or total replacement of fine aggregate and as supplementary addition to achieve different properties of concrete. In the present study, effect of foundry sand as fine aggregate replacement on the compressive strength, split tensile strength and modulus of elasticity of concrete having mix proportions of M 25 grade was investigated.

Fine aggregates were replaced with three percentages of foundry sand. The percentages of replacements were 0.5,10,15,20,25,30,35,40,45 and 50% by weight of fine aggregate. Tests were performed for compressive strength, for all replacement levels of foundry sand at different curing periods (7&28-days).

Test results showed that there is some increase in compressive strength, after replacing the fine aggregates with certain percentage of foundry sand so foundry sand can be safely used in concrete for durability and strength purposes.

1.2-INTRODUCTION OF FOUNDRY SAND:

The industrial byproducts which have been disposed earlier are now being considered for beneficial use. Beneficial use can reduce our nation’s carbon production and consumption of virgin material and result in economic gains. It is important component of nation’s solid waste management hierarchy that first promotes source reduction and waste prevention followed by reuse, recycling, energy recovery and disposal. Researches all over the world today are focusing on ways of utilizing either industrial or agricultural wastes as a source of raw materials for the industry. These wastes utilization would not only be economical, but may also result to foreign exchange earnings and environmental pollution control.

The utilization of industrial and agricultural waste produced by industrial process has been the focus of waste reduction research for economical, environmental and technical reasons. This is because over 300 million tons of industrial wastes are being produced per annual by agricultural and industrial process in India. The problem arising from continuous technological and industrial development is the disposal of waste material. If some of the waste materials are found suitable in concrete making not only can cost of construction be cut down, but also safe disposal of waste material can be achieved.

The most critical problem we are facing now a day is the deficiency of artificial resources for the construction purpose. The reason behind this is the ban of on extraction of sand ordered by government. To solve this problem, we are using solid waste from industries as a replacement material for fine aggregate i.e. used foundry sand.

The foundry industry is diverse and complex. Although there are differences in some specific operations, the basic foundry processes vary only slightly from one foundry to another. The main foundry process produces metal or alloy castings by pouring molten metal into molds. The molds may be made of molding sand and core sand or may be of a permanent type made of metal and a refractory lining. After hardening, the castings are removed from the molds, processed and finished. The raw materials (sands) used for making foundry molds are usually recycled. However, after multiple uses, they lose their characteristics, thereby becoming unsuitable for further use in manufacturing processes, and all the raw materials are then discarded as waste.

Used Foundry sand (UFS) is a discarded material coming from ferrous and nonferrous metal-casting industry. It’s a mixture of high quality size-specific silica sand, few amount of impurity of ferrous and nonferrous by-products from the metal casting process itself and a variety of binders. It can be reused several times in foundries but, after a certain period, cannot be used further and becomes waste material, referred to as used or spent foundry sand (UFS or SFS).

Many foundries have invested in sand reclamation systems that can recover up to 95 percent of sand used in the casting process. These systems represent an important environmental and
economic opportunity for foundries, helping to control production costs and to reduce the amount of waste for disposal. Even with this increase in sand reclamation, there is a limit to the number of times sand can be effectively reused in the casting process, eventually resulting in a large amount of used sand that could be beneficially reused elsewhere.

The physical and chemical characteristics of foundry sand will depend in great part on the type of casting process and the industry sector from which it originates. In modern foundry practice, sand is typically recycled and reused through many production cycles. The foundry Industry estimates that approximately 100 million tons of sand is used in production annually, of that 6-10 million tons are discarded annually and are available to be recycled into other products and are used in other industries. The automotive industries and its parts are the major generators of foundry sand. (About 95% of estimated used foundry sand).

**SCOPE**

The present work concerns the investigation of UFS utilization effect on both mortars and concretes. In particular, the performances of conglomerates (mortars and concretes), at different water/cement (w/c) ratios, are investigated. The aims is to establish the amount of used foundry sand that can be added in mixture without too heavy penalizations, principally in terms of workability, mechanical performances (i.e. compressive strength and dynamic elastic modulus) and drying shrinkage.

This research was conducted to investigate the performance of fresh and hardened concrete containing discarded foundry sands as a replacement of fine aggregate. A control concrete mix was proportioned to achieve a 28-day compressive strength of 25 MPa. Other concrete mixes were proportioned to replace 25% and 35% of regular concrete sand with clean/new foundry sand and used foundry sand by weight. Concrete performance was evaluated with respect to compressive strength.

**Objective:**

1. To economize the cost of construction without compromising with quality
2. To investigate the utilization of Used Foundry Sand as Fine aggregate and influence of UFS on the Strength on concrete made with different replacement levels
3. To check the effect of Used Foundry Sand in concrete on properties of fresh concrete & compressive strength
4. To check the suitability of Used Foundry Sand as an alternative construction material
5. To effectively utilize the waste material from the Foundries.
6. To reduce the problem of disposal of Foundry Waste.
7. To prove that the Foundry waste from Foundries can be a replacement for fine aggregate.
8. To study the physical properties of Foundries waste and are the ingredients in concrete.
9. To replace the fine aggregate by Foundry waste in different ratio such as 10,30,50,& 100 % in M20 mix concrete
10. To determine the compressive strength and compare it with the conventional concrete.

**Proposed Work:**

An extensive literature research was done and tests were conducted on byproduct samples to determine their physical properties to evaluate the possible uses. Total five mixes containing 0%,5%, 10%,15%,20%,25%, 30%,35%,40%,45%, 50%, 100% partial replacement of Artificial sand with used foundry sand for testing. Following test is carried out-

**Axial Compressive Strength Test** - Axial compression test is the most common test conducted on hardened concrete. The compression test is carried out on specimens’ cubical shape. The cube specimen is of the size 150 X 150 X 150 mm. Hence in order to compare the compressive strength of sample block with that of standard concrete block of 100% artificial resources.

**Research Significance:**

This investigation was directed toward obtaining strength and durability data on concrete incorporating used foundry sands. The results of this investigation were used to establish material specifications for concrete containing used foundry sand for architectural precast concrete panels and other similar applications. This should lead to increased utilization of used foundry sand in the manufacture of concrete for varied applications.

II. LITERATURE REVIEW

**2.1 Naik et al. (1987)**

He carried out a research on Utilization of Used Foundry Sand in Concrete. This research was conducted to investigate the performance of fresh and hardened concrete containing discarded foundry sands in place of fine aggregate. A control concrete mix was proportioned to achieve a 28-day compressive strength of 38 MPa. Other concrete mixes were proportioned to replace 25% and 35% by weight of regular concrete sand with clean/new foundry sand and used foundry sand. Concrete performance was evaluated with respect to compressive strength, tensile strength, and modulus of elasticity. At 28-day age, concrete containing used foundry sand showed about 20-30% lower values than concrete without used foundry sand. But concrete containing 25% and 35% clean/new foundry sand gave almost the same compressive strength as that of the control mix.

**2.2 Reddi et al. (1995):**

He reported that compressive strength of stabilized foundry sands decreases as the replacement proportion of foundry sand increases in the mixes and the strength is achieved relatively faster with fly ash than with cement. Cement and fly ash mixtures were prepared using 0%, 25%, 50%, 75%, & 100% levels of replacement of silica sand by foundry sand.

Initial experiments with class F fly ash were unsuccessful because it lacked cementitious properties to form a stable mix therefore subsequent experiments were restricted to class C fly ash only. The ratio of water to the cementitious binder was chosen to be 1.0 in the case of Portland cement and 0.35 in the case of fly ash. The samples were founded in PVC pipes, 2.85 cm in dia. and 5.72 cm long. The mixtures of sands and the binders were poured into these pipes and then vibrated on a vibrating table to minimize air pockets. For each of the
replacement levels, compressive strengths were obtained after 3, 7, 14, 28, & 56 days in order to evaluate the difference due to curing time. The clay bonded foundry sand reduced the strength of the stabilized mixes more than the resin- bonded foundry sands. A similar observation is made in context of fly ash stabilization. The drastic reduction in strength with an increase in clay bonded foundry sand replacement is apparent in the cases of both fly ash & cement. Cement – stabilized mixes acquired their strength considerably slower than fly ash stabilized mixes. After 7 days of curing the cement-stabilized RBS reached only 30% of peak strength whereas its fly ash counterpart achieved 80% of its peak strength.

2.3Naik et al. (1997):

He carried out the research on the effect of the clean as well as used foundry sand on the compressive strength of the concrete by using cube as well as cylinder block. He reported that compressive strength increased with age. To determine the compressive strength, 150mm × 300mm diameter cylinders were made for each flow able slurry mixtures. The compressive strength for all slurry mixtures with and without foundry sand varied from 0.17 to 0.4 Mpa at the age of 7 days. The compressive strength values ranged from 0.27 to 0.55MPa for the fly ash F1 mixtures and 0.3 to 0.6Mpa for the fly ash F2 mixtures at 28 days.

Compressive strength increased with an increasing amount of foundry sand up to certain limit, and then decreased. The strength data revealed that excavatable flow able slurry with up to 85% fly ash replacement with clear and used foundry sand can be manufactured without significantly affecting the strength of the reference mixtures. To obtain a relatively high strength at the age of 28 days and beyond for mixtures tested, fly ash replacement with foundry sand should be maintained between 30 & 50%. The amounts of foundry sand corresponding to the maximum compressive strength values were 50% for clean and clear sand for fly ash F1 mixture, 30% for used sand for fly ash F1 mixture, 70% for clean sand for fly ash F2 mixture and 30% for used sand for fly ash F2 mixture at the age of 91 days. The maximum Compressive strength for both fly ash mixtures were obtained at 30% fly ash replacement with the used foundry in spite of variation in the mixture design and source of fly ash.

2.4 Naik et al. (2001):

He reported that the min. permeability was observed at 30% fly ash replacement with foundry sand. All specimen preparations were done in accordance with ASTM C192. The permeability of mixtures was evaluated in accordance with ASTM D5084. The permeability of fly ash F1 slurry mixtures varied from 4×10-6cm/s to 72 ×10-6cm/s and for fly ash F2 the slurry mixture varied from 5x10-6cm/s to 69×10-6cm/s. The permeability for both the fly ash mixtures were only slightly affected by the increasing foundry sand content for up to 70% fly ash replacement at the age of 30 days.

The min permeability value was observed at 30% fly ash replacement level with foundry sand. However it increased abruptly when the replacement levels for the fly ashes with foundry sand were increased to 85% from 70%. The increase may be attributed to the increase in voids produced by the increase in the amount of foundry sand and to the decrease in the amount of finer particles of fly ash in the mixture. There was no significant effect of foundry sands (clean or used) on the permeability values of mixtures tested. So the permeability of test mixtures were not significantly influenced by inclusion of foundry sand up to 70% fly ash replacement and at 85% replacement of foundry sand a sharp increase in permeability was observed.

2.5Rafat Siddique, Geert de Schutter, Albert Noumowe et al. (2007)

He carried out a research on the effect of used- foundry sand on the mechanical properties of concrete. He invested that used-foundry sand is a by-product of ferrous and nonferrous metal casting industries. Foundries successfully recycle and reuse the sand many times in a foundry. After so many usages it will be an industrial waste and a research is being carried out for its possible large-scale utilization in making concrete as partial replacement of fine aggregate in a concrete.

It includes the results of an experimental investigation carried out to evaluate the mechanical properties of concrete mixtures in which fine aggregate (regular sand) was partially replaced with used-foundry sand (UFS). Fine aggregate was replaced with three percentages (10%, 20%, and 30%) of UFS by weight. Tests were performed for the properties of fresh concrete. Compressive strength, splitting- tensile strength, flexural strength, and modulus of elasticity were determined at 28, 56, 91, and 365 days. Test results indicates a marginal increase in the strength properties of plain concrete by the inclusion of UFS as partial replacement of fine aggregate (sand) and that can be effectively used in making good quality concrete and construction materials.

Following conclusions can be drawn from the present investigation:

1. Compressive strength, splitting-tensile strength, flexural strength, and modulus of elasticity of concrete mixtures increased with the increase in foundry sand contents.

2. Compressive strength, splitting-tensile strength, flexural strength, and modulus of elasticity of concrete mixtures increased with age for all the foundry sand contents.

3. Increase in compressive strength varied between 8% and 19% depending upon UFS percentage and testing age, whereas it was between 6.5% and 14.5% for splitting-tensile strength, 7% and 12% for flexural strength, and 5% and 12% for modulus of elasticity.

4. Results of this investigation suggest that used-foundry sand could be very conveniently used in making good quality concrete and construction materials.

2.6 Yucel Guney et al. (2009)

He carried out a research on the Re-Usage of Waste Foundry Sand In High-Strength Concrete. In this study, the partial re-use of waste foundry sand in high-strength concrete production was investigated. The artificial fine sand is replaced with waste foundry sand (0%, 5%, 10 %and 15%). The findings from a series of test program has shown reduction in compressive and tensile strengths, and the elasticity modulus which is directly related to waste foundry inclusion in concrete. The concrete with
10% waste foundry sand exhibits almost similar results to that of the control one. The slump and the workability of the fresh concrete decreases with the increase of the foundry sand ratio.

III. BACKGROUND INFORMATION

3.1 Foundry Sand:

3.1.1 Origin:

Foundries purchase high quality size-specific silica sands for use in their molding and casting operations. The raw sand is normally of a higher quality than the typical bank run or artificial sands used in fill construction sites.

The sands form the outer shape of the mold cavity. These sands normally rely upon a small amount of bentonite clay to act as the binder material. Chemical binders are also used to create sand “cores”. Depending upon the geometry of the casting, sands cores are inserted into the mold cavity to form internal passages for the molten metal. Once the metal has solidified, the casting is separated from the molding and core sands in the shakeout process.

In the casting process, molding sands are recycled and reused multiple times. Eventually, however, the recycled sand degrades to the point that it can no longer be reused in the casting process. At that point, the old sand is displaced from the cycle as byproduct, new sand is introduced, and the cycle begins again.

3.1.2 Production:

Foundry sand is produced by five different foundry classes. The ferrous foundry gray iron, ductile iron and steel produce the most sand. Aluminium, copper, brass and bronze produce the rest. The sand is typically used the multiple times within the foundry before it becomes a byproduct; only 10% of the foundry sand was reused. The sand from the brass, bronze and copper foundry are generally not reused. While exact numbers are not available, the best estimate is that approximately 10 million tons of foundry sand can beneficially be used annually.

3.1.3 Uses:

Foundry sand is basically fine aggregate. It can be used in many of the same ways as artificial or manufactured sands. This includes many civil engineering applications such as embankments, flow able fill, hot mix asphalt (HMA) and Portland cement concrete (PCC). Foundry sands have also been used extensively agriculturally as topsoil. Currently, approximately 500,000 to 700,000 tons of foundry sand are used annually in engineering applications. The largest volume of foundry sand is used in geotechnical applications, such as embankments, site development fills and road bases.

3.1.4 Types of Foundry Sand

There are two basic types of foundry sand available:

a) Green Sand
b) Chemically Bonded Sand
   a) Green Sand:

   Green sand consists of 85-95% silica, 0-12% clay, 2-10% carbonaceous additives, such as seacoal, and 2-5% water. Green sand is the most commonly used molding media by foundries. The silica sand is the bulk medium that resists high temperatures while the coating of clay binds the sand together. The water adds plasticity. The carbonaceous additives prevent the “burn-on” or fusing of sand onto the casting surface. Green sands also contain trace chemicals such as MgO, K2O, and TiO2.

b) Chemically Bonded Sand

Chemically bonded sand consists of 93-99% silica and 1-3% chemical binder. Silica sand is thoroughly mixed with the chemicals; a catalyst initiates the reaction that cures and hardens the mass. There are various chemical binder systems used in the foundry industry. The most common chemical binder systems used are phenolic-urethanes, epoxy-resins, furfyl alcohol, and sodium silicates.

3.1.5 FOUNDRY SAND OPERATIONS

Historically, individual foundries have typically developed their own customer base. But over time, foundries have joined together to create regional foundry consortia to pool resources and to develop the recycled foundry sand industry. FIRST (Foundry Industry Recycling Starts Today) is a national coalition of member foundries. FIRST focuses on market development of sustainable options for beneficial reuse of foundry industry byproducts.

3.1.6 Foundry Sand Physical Characteristics:

3.1.6.1 Particle Size and Shape

Foundry sand is typically sub angular to round in shape. After being used in the foundry process, a significant number of sand agglomerations form (Figure 3.1). When these are broken down, the shape of the individual sand grains is apparent.

3.1.6.2 COLOUR

Green sands are typically black, or gray, not green! (Figure 6). Chemically bonded sand is typically a medium tan or off-white color.

3.1.6.3 Durability/Soundness

Durability/Soundness of foundry sand is important to ensure the long-term performance of civil engineering applications. Durability of the foundry sand depends on how the sand was used at the foundry. Successive molding can cause the foundry sand to weaken due to temperature shock. At later stages of mold use, this can lead to the accelerated deterioration of the original sand particles. However, in civil engineering uses, the foundry sand will not normally be subjected to such severe conditions. In geotechnical applications, foundry sand often demonstrates high durability.

3.1.6.4 Chemical Composition

Chemical Composition of the foundry sand relates directly to the metal molded at the foundry. This determines the binder that was used, as well as the combustible additives. Typically, there is some variation in the foundry sand chemical composition from foundry to foundry. Sands produced by a single foundry, however, will not likely show significant variation over time. Moreover, blended sands produced by consortia of foundries often produce consistent sands. The chemical composition of the foundry sand can impact its performance.

3.2 BENEFICIAL REUSES OF FOUNDRY SAND

Foundry sand can be suitable for a variety of beneficial uses. Terminology for defining uses varies across states. For the purposes of this report, EPA has developed definitions for common uses of sand in consultation with industry experts. The following are uses of foundry sand approved in one or more states:

3.2.1 Structural Fill

Foundry sand can be used as support for structures such as roadways, parking lots, buildings, and pieces of equipment. "Encapsulated" structural fill may involve the use of a liner, cap, or cover, generally made of a clay material, which prevents water from percolating through the foundry sand and minimizes the potential for leaching.
3.2.1 Manufacturing another Product

Foundry sand is useful as a raw material in manufacturing other products, such as controlled, low-strength material (CLSM or flowable fill), asphalt, cement, concrete, grout, lightweight aggregate, concrete block, bricks, roofing materials, plastics, paint, glass, ceramics, and rockwool. Specific examples of these uses include:

• **Flowable fill:**
  Flowable fill is a liquid-like material that self-compacts and is used as a substitute for conventional soil backfill. The product is easily transported and can be readily re-excavated. The typical mixture contains sand, fly ash, Portland cement, and water. Foundry sand can readily be substituted for virgin sand in flowable fill mixtures.

• **Cement and Concrete:**
  Sand is a component of Portland cement and concrete. Portland cement requires sand with a silica content of at least 80 percent, which most foundry sands meet. It also requires certain minerals such as iron and aluminum oxides, which are found in many foundry sands. Cement and additional sand or gravel are components of concrete, allowing further reuse of foundry sand.

3.2.2 Soil Manufacturing and Amendment

Commercial soil blending operations can use foundry sand to produce horticultural soils, topsoil, potting soil, and turf mixes. These soil products are typically mixtures of sand or gravel with peat, fertilizers, and/or top soil. Foundry sand can also improve the performance of agricultural soils, and can be used as a composting ingredient.

3.2.3 Landfill Uses

Foundry sand can be used as a cover for the working face of an active landfill, for road construction within the active cell, or as a substitute for virgin aggregate in the construction of drainage layers for landfill leachate collection systems.

3.2.3 Pipe Bedding and Backfill

Foundry sand can serve as backfill for trenches created by the installation of storm and sanitary sewer lines.
3.2.4 Asphalt:

This is an application where foundry sand has been used in asphaltic (bituminous) concrete consisting of a mixture of aggregates bound together by asphalt cement.

3.2.5 Portland Cement:

Portland cement application where foundry sand has been used in the production of Portland cement (concrete). Concrete consists of a mixture of 30% sand, 50% gravel, 15% cement and 55% water. Concrete can be cast-in-place or pre-cast into concrete products such as bricks, pipes and blocks.

3.2.6 Rock Wool:

Rock wool fibers are commonly used to reinforce other materials, such as building material insulation, and are similar to fiber glass. Rock wool is produced by combining blast furnace slag with silica or alumina in a cupola and then converting the molten material into fibers. Foundry sand has proved to be an effective source of silica in rock wool. In order for the foundry sand to be used, it must first be pretreated and formed into briquettes.

3.2.7 Fine Aggregate for Concrete Block

Foundry sand has been used as a source of fine aggregate in the production of concrete block. The ultimate use, shape, and size of the product governs the type and gradation of the aggregate required in the concrete mixture.

Alternative Daily Cover

Foundry sand has been used quite successfully as an alternative cover material to the traditional 6 inches of daily soil cover required by states for active faces of a landfill. This is especially useful when a landfill operation does not have an abundant supply of on-site cover soil.

3.2.8 Hydraulic Barrier in Landfill Final Cover

Foundry sand (green sand) with clay content in excess of 6 percent, a liquid limit of greater than 20, and a plasticity index of greater than 3 has been shown to exhibit a low permeability. Studies have shown that foundry sand possessing these characteristics can be used for final cover at landfills.

Concrete is a mixture comprised of cement (10-15 percent), coarse and fine aggregates (60-75 percent) and water (15-20 percent) by volume. Foundry sand can be used as a fine aggregate substitute in PCC concrete. Fine aggregates are generally 3/8 inch or smaller, while coarse aggregates are 3/8 to 2 inches in diameter. Foundry sand meets two of the critical requirements for concrete aggregates: it is uniformly graded, and is strong, hard, and durable.

Concrete mix designs require a range of aggregate sizes, with fine aggregate making up between 20 and 35 percent of the total volume of the mix. Particle size distribution or gradation is critical to the performance of the resulting concrete. In most instances, foundry sands are too fine to allow for total substitution for the fine aggregate in a concrete mix. Foundry sand resins, lacking the finer clay particles, are often a better substitution for virgin concrete sands than are green sands.

Concrete mixes have been successfully proportioned with fine aggregate replacement ranges from 25 to 45 percent foundry sand. Some concrete mixes exhibit lower initial compressive strengths when manufactured with foundry sand, so it is important to batch test sands from individual foundry sources before scaling up to full project use. Foundry sand mixes may also require higher water ratios, due to the presence of clay and other binder materials. In general, resin sands have fewer performance limitations than foundry green sands and should demonstrate compressive strengths, tensile strengths and modulus of elasticity values similar to those of concrete produced with virgin sands.

Utilization of used foundry sand in concrete can consume a large volume of used foundry sand generated in the United States. However, before wide-spread commercial use of concrete containing used foundry sand, long-term strength and durability data are needed for developing material specifications for potential users. There are a lack of data on long-term strength and durability of such concrete systems. Therefore, this research was based on fieldwork; it was primarily focused toward determining strength and durability of concrete made with used foundry sand.

IV. METHODOLOGY

4.1 Experimental Methodology

According to the objective of the project, the minimum requirement of the strength of the structure is decided i.e. M25 sand from that mix design for M25 concrete is carried out and sampling has been decided and from that the overall quantity of the material has been calculated and material is purchased.

Before casting to find out the property of materials different tests on cement has been done such as normal consistency, initial and final setting time, soundness & fineness tests, etc. The sieving of CA through 20 mm sieve and the fine aggregate through 4.75 mm sieve is done and the sieving of Used Foundry Sand before grinding & after grinding is done for getting appropriate results. The trial mix is done with water cement ratio 0.43. The concrete blocks are casted with UFS as a Fine Aggregate in Concrete. There are three blocks for each trial mix for 28 days testing. Then the mix for water cement ratio 0.43 is final according to compliance requirement is adopted. Then the final casting has been done as per the above mix design by using 0, 10%, 30%, 50%, 100% Foundry Sand for 28 days testing and for each % there are five samples for each testing day and each sample there are three blocks.

4.2 MATERIAL PROPERTIES

4.2.1 Cement

Cement is a binder, a substance that sets and hardens independently, and can bind other materials together. Cement used in construction is characterized as hydraulic or non-hydraulic. Hydraulic cements (e.g., Portland) harden because of hydration, chemical reactions that occur independently of the mixture’s water content; they can harden even underwater or when constantly exposed to wet weather. The chemical reaction that results when the anhydrous cement powder is mixed with water produces hydrates that are not water-soluble. Cement is fine grey powder. It is mixed with water and material such as sand gravel, and crushed stone to make concrete. 53 grade ordinary Portland cement (ACC cement) was used for all casting. Testing of cement is done as per the IS: 8112-1989. The results are given below.
4.2.2 Fine Aggregate

Fine aggregate is defined as aggregate whose size is 4.75 mm and less. For increased workability and for economy as reflected by use of less cement, the fine aggregate should have a rounded shape. The purpose of the fine aggregate is to fill the voids in the coarse aggregate and to act as a workability agent. Artificial sand with 4.75mm maximum size is used as per IS: 383-1970. It satisfied all requirements. Results are given in table.

### Table No 3.2-Properties of Fine Aggregate

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Type</td>
<td>Natural</td>
</tr>
<tr>
<td>2.</td>
<td>Specific gravity</td>
<td>2.6</td>
</tr>
<tr>
<td>3.</td>
<td>Total water absorption</td>
<td>3.45%</td>
</tr>
<tr>
<td>4.</td>
<td>Fineness modulus</td>
<td>2.453</td>
</tr>
<tr>
<td>5.</td>
<td>Grading zone</td>
<td>III</td>
</tr>
</tbody>
</table>

### Table No 3.3- Sieve analysis of Fine Aggregate

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sieve No.</th>
<th>Weight (gms)</th>
<th>Retained Weight (gms)</th>
<th>Cumulative Retained Weight (gms)</th>
<th>% Retained</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.75mm</td>
<td>35</td>
<td>35</td>
<td>3.5</td>
<td>96.5</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>2.36mm</td>
<td>235</td>
<td>270</td>
<td>27</td>
<td>73</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>1.18mm</td>
<td>320</td>
<td>590</td>
<td>59</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>600µm</td>
<td>189</td>
<td>779</td>
<td>77.9</td>
<td>22.1</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>300 µm</td>
<td>135</td>
<td>914</td>
<td>91.4</td>
<td>8.6</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>150 µm</td>
<td>56</td>
<td>970</td>
<td>97</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>75µm</td>
<td>17</td>
<td>987</td>
<td>98.7</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Pan</td>
<td>13</td>
<td>1000</td>
<td>100.0</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>
4.2.3 Coarse Aggregate

Coarse Aggregate is defined as whose size is bigger than 4.75 mm. It should be angular shaped for possessing well defined edges formed at the intersection of roughly planar faces. Locally available coarse aggregate having maximum size 20mm is used. It is tested as per IS: 383-1970. Results are given in table.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Characteristics</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Type</td>
<td>Crushed</td>
</tr>
<tr>
<td>2.</td>
<td>Maximum size</td>
<td>20mm</td>
</tr>
<tr>
<td>3.</td>
<td>Specific gravity</td>
<td>2.89</td>
</tr>
<tr>
<td>4.</td>
<td>Total water absorption</td>
<td>1.2%</td>
</tr>
<tr>
<td>5.</td>
<td>Fineness Modulus</td>
<td>8.02</td>
</tr>
<tr>
<td>6.</td>
<td>Shape</td>
<td>Angular</td>
</tr>
</tbody>
</table>

Table 3.4-Properties of Coarse Aggregate

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sieve Size</th>
<th>Wt. Retained</th>
<th>Cumulative Retaining</th>
<th>% Retaining</th>
<th>% Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0.00</td>
<td>100.00</td>
</tr>
<tr>
<td>2</td>
<td>25</td>
<td>138</td>
<td>138</td>
<td>13.8</td>
<td>86.2</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>247.1</td>
<td>385.1</td>
<td>38.51</td>
<td>61.49</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
<td>375</td>
<td>760.1</td>
<td>76.01</td>
<td>23.99</td>
</tr>
<tr>
<td>5</td>
<td>12.5</td>
<td>191.7</td>
<td>951.8</td>
<td>95.18</td>
<td>4.82</td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td>46</td>
<td>997.8</td>
<td>99.78</td>
<td>0.22</td>
</tr>
<tr>
<td>7</td>
<td>4.75</td>
<td>2.2</td>
<td>1000</td>
<td>100</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 3.5- Sieve analysis of Coarse Aggregate
4.2.5 Used Foundry Sand

Used Foundry sand is obtained locally. It is used as a partial replacement (0%, 10%, 30%, 50%, & 100%) to the fine aggregate (Artificial Sand). The tests are conducted on UFS for its physical properties. Results are given in table

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Sieve No.</th>
<th>Weight Retained (gms)</th>
<th>Cumulative Weight Retained (gms)</th>
<th>% Retained</th>
<th>% Passing of Foundry Sand</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>4.75mm</td>
<td>2.0</td>
<td>2.0</td>
<td>0.20</td>
<td>99.9</td>
</tr>
<tr>
<td>2.</td>
<td>2.36mm</td>
<td>9.2</td>
<td>11.2</td>
<td>1.12</td>
<td>98.95</td>
</tr>
<tr>
<td>3.</td>
<td>1.18mm</td>
<td>25.3</td>
<td>36.5</td>
<td>3.65</td>
<td>96.40</td>
</tr>
<tr>
<td>4.</td>
<td>600 µm</td>
<td>30.0</td>
<td>66.5</td>
<td>6.65</td>
<td>92.80</td>
</tr>
<tr>
<td>5.</td>
<td>300 µm</td>
<td>432.3</td>
<td>498.8</td>
<td>49.88</td>
<td>50.3</td>
</tr>
<tr>
<td>6.</td>
<td>150 µm</td>
<td>456.2</td>
<td>955</td>
<td>95.5</td>
<td>4.5</td>
</tr>
<tr>
<td>7.</td>
<td>75 µm</td>
<td>45.0</td>
<td>1000</td>
<td>100.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table No 3.3- Sieve analysis of Used Foundry Sand

Finess Modulus=$\frac{\text{Sum of Cumulative Weight Retained}}{\text{100}}$

$= \frac{257.00}{100}$

$= 2.57$

Zone of Foundry Sand:- Zone IV
4.2.4 Water

The water used for mixing and curing should be clean and free from injurious quantities of alkalis, acid, oils, salt, sugar, organic materials, vegetable growth and other substances that may be deleterious to concrete or steel. Potable water is generally considered satisfactory for mixing. The pH value of water should be not less than 6. Generally, water that is suitable for drinking is satisfactory for use. Water from lakes and streams that contain marine life also usually is suitable. When water is obtained from sources mentioned above, no sampling is necessary. When it contains sewage, mine water, or wastes from industrial plants or canneries, it should not be used in the mix, unless tests indicate that it is satisfactory. Water from such sources should be avoided since the quality of the water could change due to low water or by intermittent discharge of harmful wastes into the stream. In the present experimental programme, potable tap water is used for casting.

4.3 MIX DESIGN

Concrete Mix Design of M 25 by IS code Method (IS 10262-2009):

Mix design is the process of selecting suitable ingredients of concrete and determining their relative proportion with the object of producing concrete of certain minimum strength and durability as economical as possible.

a. The first object is to achieve the stipulated minimum strength and durability.

b. The second object is to make concrete in the most economical manner.

A) Design Stipulation:

1) Grade designation : M 25
2) Type of cement : OPC 53 grade conforming to IS 8112
3) Maximum nominal size of aggregate : 20 mm
4) Minimum cement content : 360 kg/m$^3$
5) Maximum water-cement ratio : 0.43
6) Workability : 50 mm (Slump)
7) Exposure condition : Extreme
8) Degree of supervision : Very Good.
9) Type of aggregate : Crushed angular aggregate.
10) Maximum cement content : 450 kg/m$^3$
11) Chemical admixture type : None

B) Test date for material:

1) Cement used : OPC 53 grade conforming to IS 8112.
2) Specific gravity of cement : 3.15
3) Chemical admixture : None
4) Specific gravity for:
   A. Coarse aggregate : 2.89
   B. Fine aggregate : 2.6
5) Sieve analysis:
   A. Fine aggregate : Zone III
C) Target mean strength:
Target mean strength for specified characteristic cube strength is

\[ f'_{ck} = f_{ck} + 1.65 \delta \]

Where

- \( f'_{ck} \) = Target Average Compressive Strength at 28 days,
- \( f_{ck} \) = Characteristic Compressive Strength at 28 days, and
- \( \delta \) = Standard Deviation.

From Table 1, Standard Deviation, \( \delta = 4 \text{ N/mm}^2 \)

Therefore,

Target Mean Strength = 25 + 1.65 \times 4.0 = 31.6 \text{ N/mm}^2

D) Selection of water cement ratio:
From Table 5 of IS 456, maximum Water-Cement ratio = 0.55
Based on W/C graph, adopt Water-Cement ratio = 0.43

0.43 < 0.55, Hence OK

E) Selection of Water Content:
From Table 2, maximum water content = 186 litre (for 25 to 50 mm slump range) for 20 mm aggregate

Estimated water content for 50 mm slump = No correction (if slump range in 25-50 mm)

F) Calculation of Cement Content:
Water-Cement ratio = 0.43
Cement Content = (186/0.43) = 432.55 kg/m^3

From Table 5 of IS 456, minimum cement Content for ‘Extreme’ exposure condition = 360 kg/m^3

432.55 Kg/m^3 > 360 Kg/m^3, hence O.K.

G) Calculation of Fine Aggregate and Coarse Aggregate Content:
For specified maximum size of the aggregate of 20mm, the amount of entrapped air in the wet concrete, is 2 percent.

\[
V = \left[ \frac{(\text{Required Water Content}) + \left( \frac{\text{Cement Content}}{\text{Sp. Gravity of Cement}} \right) \times 1}{3.15 \times \frac{\text{Fine Agg. Content}}{\text{Sp.Gravity of Fine Agg.}}} \right] \times \frac{1}{1000}
\]

0.98 = \left[ 186 + \frac{432.55}{3.15} + \frac{1}{3.15} \times \frac{F_a}{2.6} \right] \times \frac{1}{1000}

\[
F_a = 537.82 \text{ Kg/m}^3
\]

\[
C_a = \frac{1 - 0.315}{0.315} \times F_a \times \frac{2.6}{2.6}
\]

\[
C_a = 1169.55 \text{ Kg/m}^3
\]

According to Actual condition:

<table>
<thead>
<tr>
<th>Water</th>
<th>Cement</th>
<th>Fine Aggregate</th>
<th>Coarse Aggregate</th>
</tr>
</thead>
<tbody>
<tr>
<td>186 Kg/m^3</td>
<td>432.55 Kg/m^3</td>
<td>537.82 Kg/m^3</td>
<td>1169.55 Kg/m^3</td>
</tr>
<tr>
<td>0.43</td>
<td>1.00</td>
<td>1.24</td>
<td>2.70</td>
</tr>
</tbody>
</table>

4.4 Mixing process adopted:
The concrete shall be mixed by hand or preferably, in a laboratory batch mixer, in such a manner as to avoid loss of water or other materials. Each batch of concrete shall be of such a size as to leave about 10 percent excess after moulding the desired number of test specimens.
4.5 Testing of Concrete

The main objective of testing was to know the behavior of concrete with replacement of Used Foundry Sand to some percentage to Fine Aggregate at room temperature.

The main parameters studied were compressive strength and workability test. The materials used for casting concrete samples along with tested results are described and in this project we are going to compare the strength of concrete block by using zero percentage Used Foundry Sand with the concrete block using some percentage of Used Foundry Sand by following test. At the same time we were studied the effect of Used Foundry Sand on the workability, segregation and bleeding of concrete at the time of casting.

4.5.1 Compressive Strength Test

Compression test is the most common test conducted on harden concrete, partly because it is an easy test to perform and partly because most of the desirable characteristic properties of concrete are qualitatively related to its compressive strength. The standard compressive strength of concrete is determined through compression tests performed on concrete cube of size 15 × 15 × 15 cm. Freshly mixed concrete is filled in metal moulds. The specimens are taken out of the moulds after 24 hours and moist-cured for 28 days. After completion of above days the cubes are tested by loading them till failure using a compression machine. The recorded load value P at failure is used to determine the compressive strength.
a) **Aim**
To determine the compressive strength of concrete specimens prepared and to verify the strength requirements as desired in the mix design and stipulated in the IS code 516.

b) **Apparatus**
Compression Testing Machine

c) **Specimen**
15 cubes of 15 cm size of mix M25.

d) **Mixing**
Through mixing of the concrete by machine mixing (Drum type concrete mixer).
e) Hand Mixing

i. Mix the cement and fine Aggregate on a water tight non-absorbent platform until the mixture is thoroughly blended and is of uniform colour.

ii. Add the coarse aggregate and mix with the cement and fine aggregate until the coarse aggregate is uniformly distributed throughout batch.

iii. Add water and mix until the concrete appears to be homogenous and of the desired consistency.
f) Method of Compaction
i. Clean the mould and apply oil.
ii. Keep the mould on vibrating table.
iii. Fill the concrete in the moulds in layers approximately 5 cm thick.
iv. Vibration is given for 2 minutes.
v. Compact each layer with not less than 35 strokes per layer using a tamping rod (Steel bar 16mm diameter and 60cm long, bullet pointed at lower end).
vi. Level the top surface and smoothen it with a trowel. Vibration is given for 2 minutes.

h) Curing
The test specimens are stored in moist air for 24 hours and after this period the specimens are marked and removed from the moulds and kept submerged in clear fresh water until taken out prior to test.

h) Procedure
i. Remove the specimen from water after specified curing time and wipe out excess water from the surface.
ii. Take the dimensions of the specimen.
iii. Clean the bearing surface of the testing machine.
iv. Place the specimen in the machine in such a manner that the load shall be applied to the opposite sides of the cube cast.
v. Align the specimen centrally on the base plate of the machine.
vi. Rotate the movable portion gently by hand so that it touches the top surface of the specimen.
vii. Apply the load gradually without shock and continuously at the rate of 6 KN/sec till the specimen fails.
viii. Record the maximum load at failure.
V. RESULTS AND DISCUSSIONS

5.1 Compressive strength

Compression test is the most common test conducted on hardened concrete, partly because it is an easy test to perform and partly because most of the desirable characteristic properties of concrete are qualitatively related to its compressive strength.

In this test, the values of compressive strength for different replacement levels of bagasse ash contents (0%, 10%, 30%, 50%, & 100%) at the end of different curing periods (28 days) are given in Table 5.1. These values are plotted in Figure 5.1 which show the variation of compressive strength cement replacement at different curing ages respectively.

<table>
<thead>
<tr>
<th>Foundry Replacement %</th>
<th>Sand Compressive strength of concrete blocks (N/mm²)</th>
<th>% difference in Compressive Strength of concrete blocks with 0% of Used Foundry Sand</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>27.17</td>
<td>0</td>
</tr>
<tr>
<td>10%</td>
<td>29.79</td>
<td>9.64%</td>
</tr>
<tr>
<td>30%</td>
<td>30.66</td>
<td>12.84%</td>
</tr>
<tr>
<td>50%</td>
<td>29.07</td>
<td>6.99%</td>
</tr>
<tr>
<td>100%</td>
<td>25.58</td>
<td>-5.85%</td>
</tr>
</tbody>
</table>

Table No.5.1-Result Compressive Strength Comparison with 0% Replacement.

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>0%</th>
<th>10%</th>
<th>30%</th>
<th>50%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>28.34</td>
<td>29.64</td>
<td>30.52</td>
<td>27.90</td>
<td>26.16</td>
</tr>
<tr>
<td>2</td>
<td>26.16</td>
<td>30.52</td>
<td>30.08</td>
<td>26.18</td>
<td>30.52</td>
</tr>
<tr>
<td>3</td>
<td>27.03</td>
<td>29.21</td>
<td>31.39</td>
<td>33.13</td>
<td>20.05</td>
</tr>
<tr>
<td>Average</td>
<td>27.17</td>
<td>29.79</td>
<td>30.66</td>
<td>29.07</td>
<td>25.58</td>
</tr>
</tbody>
</table>

Table No 5.2 -Result of 28 days compressive strength
Graph No 5.1 - 28 days compressive strength Comparison

Comment:
From the graph of 28 days Compressive Strength Comparison, it can be seen that compressive strength of concrete with partial replacement of Used Foundry Sand (0% to 30%) has increased up to 30% replacement and after that goes on decreasing as compared to concrete mix with natural sand.

The Compressive Strength of Concrete mix with 10%, 30%, 50% Foundry Sand has increased as compared to Concrete Mix with artificial Sand. The % increase is in the range of 6% to 13% as compared to concrete mix with artificial Sand.

The Compressive Strength of Concrete mix with 100% Foundry Sand has decreased as compared to Concrete Mix with natural Sand. The % decrease is in the range of up to 6% as compared to concrete mix with natural Sand.

REFERENCES
PHOTOGRAPHS
Same Racial Marriages Role in Mental Health Problem among Young Adults

Nighat Gul 1Nasreen Ghani 1Shaheen Ghani 2

Department of psychology of postgraduate college for women, Department of Psychiatry, Ayyub Medical College, Institute of Nursing Sciences Khyber Medical University Peshawar

Abstract- Effect of inter and intra marriages on the mental health of the adults has been study by different people in different cultures by applying the David mental health inventory (MHI38) scale. In Pakistan this area of study was neglect, therefore researchers pay attention on it’s and conduct an empirical and scope able research. Methods: comparative study design used in this quantitative approach. Form district Hari pur draw the sample of 300 participants. Sampling techniques was the simple random. Sample size consisted of (N = 150) both male and female and MHI 38 scale were used which is consisting of 38 items. Results: there by the results positive features of mental health higher in intra marriage rather than inter marriages family adults such as Life satisfaction Emotional and General positive effect scores were higher in intra marriages adults and negative features of mental health intensity level were higher in inter marriages adults such as Loss of behavior and Anxiety. Results of all mental health factors were significant at p = .0001 level. Conclusion: consequences of the study were indicated mental health of outside marriages family adults were better then within family marriages adults. This obviously declare inter marriages are the source for transferring the psychological syndromes in the new generation. By inter marriages psychological syndromes transferred in new generation rather then intra marriages.

Index Terms- Inter marriages, intra marriages, empirical, comparatative, quantitative, simple random sampling, emotional ties, lost of behavior, emotional ties, positive effect, syndromes.

I. INTRODUCTION

Many studies have indicated marriages play a great role in health and as well on mental health. When Marriage between those people belonging to same religious and ethnic group is called same racial marriage.1 As the majority community believes of Same racial marriage as an human being occurrence, they have a propensity to assume of the pair rate as the individual rate and are persistently twice as fear by the result.2 Well adjusted person in a society is called the normal person.3 Health care suppliers and inheritance expert might deem mutually the pessimistic impact of consanguineous wedding in conditions of enlarged hereditary threats toward the young, since different to the latent communal and financial reimbursement.4 Therefore, one’s communal position, such as one’s battle, societal group and sex has the latent to be connected to all parts of the methods together with stressors, arbitrate capital and mental health result.5 Researches continuously show to facilitate the social class of individuals openly and ultimately influence their health and welfare. Particularly, individuals of a inferior societal category have a tendency to have inferior physical and mental health conclusions.6 Discovered mental illness cause is the same racial family marriages. Physical and psychological well being is due to non racial marriages.7

In this study participants were taken from different countries (N = 883) and results declared there is a great impact of inter marriages on mental health of the individuals then intra marriages.8

This investigation obvious that, there is the great negative impact of inters marriages with people first cousins. When there first cousins couple babies have more mental and physical disabilities.9 Young adults are commonly an individual with 20 to 39 age range according to Erik son. They mostly remain busy in career making, married with babies and with out babies, mostly live with their parents.10

Objectives
The objectives of the study are as following:
1. To explore the effects of same racial and non racial marriages on the mental health of the young adults.
2. To find the direct relationship of non same racial remarriages family on mental abnormalities of young adults.
3. To discover the inverse relationship of racial marriages with mental health abnormalities.

Hypothesis
Following are the hypothesis:
H1: Same racial marriages and young adult’s mental health have a direct relationship with each other.
H2: Non same racial marriages and mental abnormalities have inverse relationship with each other

Operational definitions

II. MATERIAL AND METHOD
Total drawn sample of present study is (N=300) and (n=150) was taken to non racial marriages young adults and (n=150) to non same racial marriages families randomly (n= 75) respectively to two tehasils of district haripur equally for both group of study. Present study research design is comparatative. For analysis purpose was used the SSPS software and apply independent t test.
III. RESULTS

In this present study, the data was \((N = 150)\) adolescent age taken from Same racial marriages and non racial marriages of district Haripur. Findings of the study attain the research purpose that mental health is higher in non racial marriages as compared to Same racial marriages. Same racial marriages and mental abnormalities have inverse relationship with each other.

Table-1 numerical values screening that Life satisfaction of non racial marriages with \((M = 1.81, SD=.458)\) is higher. While life satisfaction in the Non racial marriages is lower that is \((M=1.29, SD=.392)\). This indicates that Life satisfaction is affected by marriage type.

Table-2 statistical values revealed that anxiety of non racial marriage with \((M = 33.09, SD=7.811)\) is higher. While level of anxiety in the Non racial marriages type is lower that is \((M=1.63,SD=.487)\). This indicates that anxiety level is affected by marriage type.

Table-3 statistical values exposed that depression of Same racial marriage with \((M = 14.81, SD=3.475)\) is higher. The statistical values exposed that depression of non racial marriage with \((M=1.33, SD=.475)\) is low. This indicates that depression level is affected by marriage type.

Table-4 statistical values viewing that General positive effect of non racial marriage with \((M = 2.73, SD=.487)\) is higher and in non racial marriage\((M=0.37, SD=.487)\) values indicates that, general positive effect is low in non racial marriageyoung adult’s. This point out that General effect is affected by marriage type.

Table-5 statistical values viewing that lost of behavior in same racialmarriage with \((M = 1.51, SD=.503)\) is higher. Statistical values showing that lost of behavior in non racialmarriage with \((M=1.12 , SD=.327)\) is lower. This indicates that lost of behavior is affected by marriage type.

Table-6 numerical values screening that Emotional ties of non racialmarriage type with \((M =1.72, SD=.458)\) is high. Numerical values screening that Emotional ties of non racial marriage type with \((M =1.29, SD=.452)\) is lower. This indicates that Emotional ties are affected by marriages.

### Table-1: Results of t-test and Descriptive Statistics for life satisfaction Among Non racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non same racial marriages</th>
<th>Same racial marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life satisfaction</td>
<td>1.29 (.392)</td>
<td>1.81 (.458)</td>
<td>7.465</td>
</tr>
</tbody>
</table>

*p<.05

### Table-2: Results of t-test and Descriptive Statistics for anxiety Among Non racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non racial marriages</th>
<th>Same racial marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>1.63 (.487)</td>
<td>33.09 (7.811)</td>
<td>-34.822</td>
</tr>
</tbody>
</table>

*p<.001

### Table-3: Results of t-test and Descriptive Statistics for depression Among Non racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non same racial marriages</th>
<th>Same racial marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>1.33 (.475)</td>
<td>14.81 (3.475)</td>
<td>-33.829</td>
</tr>
</tbody>
</table>

*p<.001

### Table-4: Results of t-test and Descriptive Statistics for General positive effect Among Same racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>same racial marriages</th>
<th>Non Same racial marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General positive effect</td>
<td>1.71 (.458)</td>
<td>0.37 (.487)</td>
<td>4.317</td>
</tr>
</tbody>
</table>

*p<.05

### Table-5: Results of t-test and Descriptive Statistics for loss of behavior Among Non racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non same racial marriages</th>
<th>Same racial marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of behavior</td>
<td>1.12 (.327)</td>
<td>1.51 (.503)</td>
<td>-5.578</td>
</tr>
</tbody>
</table>

*p<.001
Table-6: Results of t-test and Descriptive Statistics for emotional ties Among Non racial marriages and same racial marriages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Non same racial marriages</th>
<th>Same marriages</th>
<th>t(150)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional ties</td>
<td>M(SD)</td>
<td>M(SD)</td>
<td>5.740</td>
</tr>
<tr>
<td></td>
<td>1.29(.452)</td>
<td>1.72 (.458)</td>
<td></td>
</tr>
</tbody>
</table>

*p<.05

IV. DISCUSSION

The score of mean value of mental health is greater in Same racial marriages and in less in Same racialmarriages .Mental health in Same racialmarriages is also less and Same racialmarriages is greater. A finding indicates same racialmarriages young adult’s mental health is higher as compared to same racialmarriages. Results of the current study exposed p<.05 in present study consequently; Same racial marriages and mental health have a direct relationship with each other.

First hypothesis: the first hypothesis is about the same racial marriages and young adults mental health has a direct relationship with each other. The mental health problems are more common in same racial marriages young adults. Chances of mental health problems increased due to within family marriages rather than out of family marriages. Results of tables no 1,2, 3, 4, 5 and 6 exposing mental health problems more in those young adults who belong to within family married couples, adults of non within family couples adults facing less mental health problems. This study fact is approving by Korean study. Mental health is associated with same racial marriages and increased risks of having a higher level of anxiety were practical in refugee women measured up to inhabitant Korean women. Young adults of the migrant group were probable to have more same cultural examine and externalizing behavioral symptoms than those of the inhabitant group. This model was more obvious in youthful adults of mothers with higher levels of anxiety. The present study found a higher risk for mild anxiety in same racial marital immigrant than in citizen of Korean women. In addition, bearing in mind that refugee young adults seemed to have more poignant and behavioral troubles next of kin to inhabitant young adults if their mothers have higher levels of anxiety, particular concentration should be paid to avoidance and in the early hours same racial for mental health problems of same ethnic marital women. The mental health position of immigrant women throughout same racial marriages and its effects on emotional and behavioral problems of young adults.11

Second hypothesis is about the same racial marriages and mental abnormalities have an inverse relationship with each other. Mental health is higher in same racial marriages and low in non same racial marriages. This has been proved by the consequences of the table 1-6. Consequences explained there is high ratio of anxiety, depression and loss of behavior in same racial families’ adults and low level of emotional ties life satisfaction and general positive effect in same racial couples’ young adults. There is high level of life satisfaction, emotional ties and general positive effect in non same racial family’s adults. Contrary low level of depression, anxiety and loss of behavior in non same ethnic group married couples’ young adults. In same racial couples’ adults’ mental health problems are higher due to heredity factor as compare to non-same racial couple’s young adults facing less mental health problems. This study phenomenal proven by this study which done on at least 55% of British Pakistanis are married to first cousins and the tradition is also common among some other South Asian communities and in some Middle Eastern countries. But there is a problem: marrying someone who is themselves a close family member carries a risk for young adults, a risk that lies within the code of life, inside our genes. Communities that practice cousin marriage experience higher levels of some very rare but very serious illnesses known as recessive genetic disorders. Such unions are seen as strong because they build on tight family networks and family events gets better because the in-laws are already related to each other and have the same family history. But the statistics for genetic illness in cousin marriages is serious as British Pakistanis are 13 times more likely to have young adults with genetic disorders than the general population.12

AUTHORS CONTRIBUTION

Nighetgul writes the literature review and collects the data and did work on method section.

REFERENCES


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Challenges of the Novices Nurses working in tertiary care cardiac hospital of Karachi Pakistan

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** Lecturer Rufaidah Nursing College Peshawar
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Abstract- Almost every new inexperienced professional during initial months of clinical practice have certain level of anxiety and face enormous challenges to adopt new working environment. This study was designed to identify the perceived challenges faced by novice Nurses. Objectives: The aim of this study was to find out challenges of novices nurses and to help them in adapting to the environment in the initial days of their career and also to determine the need for developing or improving the orientation program.

Methods: A descriptive cross sectional study was conducted by using convenience non-probability sampling technique to recruit 26 study participants. Data was obtained through a self-administered questionnaire after pilot testing from 10 % of the participants and analyzed through SPSS version 19.0.

Results: Different challenges of the novice nurses were identified to be different for various procedures, policies and skills. The study revealed that novice nurses faced different challenges during the first year of their career including workload, lack of confidence, lack of communication skills, and little knowledge about different procedures, time management and low competency level in performing certain clinical skills.

Conclusion: There is need of improving the existing orientation programs in the organizations to help the novice nurses in overcoming their challenges and improving incompetence.

Index Terms- Novice nurses, competencies, challenges

I. INTRODUCTION

Novice nurses are prone to face multiple challenges while beginning as practical nurses which resulted in work incompetence, high level of burn out and depersonalization among them as compare to their experienced counter partners. (Watson, Macdonald & Brown, 2013).

The challenges face by the novice nurses are career transition, stressful work environment and inadequate support (Vanwyneegen & Stuart, 2012). New graduates often feel incompetent, overwhelmed and under prepare for their professional role which is reflected by their lack of confidence, intense stress and conflict with their working environment, which may lead to the early termination of a nurse career (Goodridge 2003) According to Johnson & Rae (2009, as cited in Berry, Gillespie, Gates & Schafer, 2012), approximately one in every three novice nurses quit their jobs, due to the problems they face during initial years of their careers. About 30% of new graduate nurses leave their jobs during first year of their careers. This high turnover of novice nurses increase workload on nursing team as they have to manage their work with less staff and may reduce the standards of nursing care provided by the organization (Hillman and Foster, 2011) and shortage of staff has resulted in reducing the standard of patient care by increasing workload and mandatory overtime for the nurses. This high turnover ratio not only impacts nurses’ careers but also the organization because hiring new nurses can be very expensive for them (Jewell, 2013). The turnover cost for an organization was calculated to be $44,000 per nurse for one year Therefore, Organizations must be acquainted of the transition required of new graduate nurses entering into professional practice and implement strategies to support their transition, which can result in increased retention rates (Baggot, 2005).

This study will likely help novice nurses to reflect on their challenges and may help as a basic guideline for researchers for further studies on the same problem and accomplish a comprehensive orientation program for the novice nurses.

II. METHODS

The setting of the study was a tertiary care cardiac hospital of Karachi. The study was conducted through descriptive study design by using convenience non-probability sampling to recruit 26 study participants working in Intensive Care Unit (ICU), High Dependency, Step down Unit, Cardiac Emergency, General wards, Private ward and Day Care Units. The inclusion criteria for the participants was nurses how have completed their basic diploma and are working as staff nurses in different departments having less than one year working experience. An informed consent was presented to all participants and data was obtained through a self-administered questionnaire after pilot testing from 10 % of the participants and analyzed through SPSS version 19.0. It was mainly focused on determining competency level of the novice nurses, gaps in the current knowledge & skills and challenges during the first year of their career.

III. RESULTS

The study shows that novice nurses face different challenges mainly related to deficits in knowledge and skills and also lack of orientation to different policies. The knowledge deficits were related to many procedures and policies of the hospital. 50 % of the participants had little or no knowledge of black code, 46.1 % had limited or no knowledge about red code, 69.2 % had limited...
or no knowledge about ventilator, 53.9 % had no or little knowledge about Central Venous Pressure line (CVP), 39.1 % had no knowledge about arterial line, 69.3 % had limited or no knowledge about Intra-aortic balloon pump (IABP) see table 1. On the other hand, result related to competencies in skills’ performance and following standards steps of procedure (SOPs) shows that most of the staffs were rating themselves either excellent or good in performing standards steps of procedures. See table 2. 80.8 % of the study participants are facing job related challenges. Those findings suggested that knowledge deficits about medications, difficulty in communication with patients and their relatives, stressful working environment, lack of support, workload, staffing shortage, and communication gap between staff are the main challenges faced by them (See table 3).

<table>
<thead>
<tr>
<th>S no.</th>
<th>Variables</th>
<th>Excellent</th>
<th>Good (enough knowledge)</th>
<th>Average (Limited knowledge)</th>
<th>Fair (No knowledge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge about Blue code</td>
<td>26.9 %</td>
<td>57.5 %</td>
<td>15.4 %</td>
<td>0 %</td>
</tr>
<tr>
<td>2</td>
<td>Knowledge about black code</td>
<td>15.4 %</td>
<td>34.6 %</td>
<td>19.2 %</td>
<td>30.8 %</td>
</tr>
<tr>
<td>3</td>
<td>Knowledge about Red code</td>
<td>19.2 %</td>
<td>34.6 %</td>
<td>19.2 %</td>
<td>26.9 %</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge about code alpha 10</td>
<td>19.2 %</td>
<td>34.6 %</td>
<td>26.9 %</td>
<td>19.2 %</td>
</tr>
<tr>
<td>5</td>
<td>Knowledge about policy of IV cannulation</td>
<td>46.2 %</td>
<td>46.2 %</td>
<td>3.8 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>6</td>
<td>Knowledge about policy of blood transfusion</td>
<td>61.5 %</td>
<td>26.9 %</td>
<td>7.7 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>7</td>
<td>Knowledge about Documentation</td>
<td>61.5 %</td>
<td>30.8 %</td>
<td>7.7 %</td>
<td>0 %</td>
</tr>
<tr>
<td>8</td>
<td>Knowledge about Blood sampling</td>
<td>53.8 %</td>
<td>38.5 %</td>
<td>3.8 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>9</td>
<td>Knowledge about Medication administration</td>
<td>61.5 %</td>
<td>30.8 %</td>
<td>7.7 %</td>
<td>0 %</td>
</tr>
<tr>
<td>10</td>
<td>Knowledge about shifting of patients to the other wards</td>
<td>53.8 %</td>
<td>38.5 %</td>
<td>3.8 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>11</td>
<td>Knowledge about own responsibilities</td>
<td>38.5 %</td>
<td>57.7 %</td>
<td>3.8 %</td>
<td>0 %</td>
</tr>
<tr>
<td>12</td>
<td>Knowledge about Team members responsibilities</td>
<td>34.6 %</td>
<td>50.0 %</td>
<td>11.5 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>13</td>
<td>Knowledge about angiography</td>
<td>15.4 %</td>
<td>53.8 %</td>
<td>30.8 %</td>
<td>0 %</td>
</tr>
<tr>
<td>14</td>
<td>Knowledge about angioplasty</td>
<td>19.2 %</td>
<td>53.8 %</td>
<td>23.1 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>15</td>
<td>Knowledge about ECG interpretation</td>
<td>19.2 %</td>
<td>30.8 %</td>
<td>46.2 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>16</td>
<td>Knowledge about drugs used in your department</td>
<td>23.1 %</td>
<td>53.8 %</td>
<td>23.1 %</td>
<td>0 %</td>
</tr>
<tr>
<td>17</td>
<td>Knowledge about Ventilator</td>
<td>3.8 %</td>
<td>26.9 %</td>
<td>53.8 %</td>
<td>15.4 %</td>
</tr>
<tr>
<td>18</td>
<td>Knowledge about CVP care</td>
<td>0 %</td>
<td>46.2 %</td>
<td>38.5 %</td>
<td>15.4 %</td>
</tr>
<tr>
<td>19</td>
<td>Knowledge about Arterial line</td>
<td>15.4 %</td>
<td>34.6 %</td>
<td>30.8 %</td>
<td>19.2 %</td>
</tr>
<tr>
<td>20</td>
<td>Knowledge about ABG interpretation</td>
<td>26.9 %</td>
<td>34.6 %</td>
<td>26.9 %</td>
<td>11.5 %</td>
</tr>
<tr>
<td>21</td>
<td>Knowledge about IABP (Intra-aortic balloon pump)</td>
<td>3.8 %</td>
<td>26.9 %</td>
<td>46.2 %</td>
<td>23.1 %</td>
</tr>
<tr>
<td>22</td>
<td>Knowledge about hierarchy of organization</td>
<td>15.4 %</td>
<td>57.7 %</td>
<td>15.4 %</td>
<td>11.5 %</td>
</tr>
<tr>
<td>23</td>
<td>Knowledge about Nosocomial infections</td>
<td>19.2 %</td>
<td>46.2 %</td>
<td>30.8 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>24</td>
<td>Knowledge about strategies for the prevention Nosocomial infections</td>
<td>26.9 %</td>
<td>42.3 %</td>
<td>26.9 %</td>
<td>3.8 %</td>
</tr>
</tbody>
</table>

Table 1. Knowledge about different procedures and policies of the Hospital

Table 2. Follow the standard of procedures of different Nursing skills:

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Variables</th>
<th>Excellent</th>
<th>Good</th>
<th>Average</th>
<th>Fair</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Follow Standard of procedure (SOP) for IV Cannulation</td>
<td>42.3 %</td>
<td>50.0 %</td>
<td>7.7 %</td>
<td>0 %</td>
</tr>
<tr>
<td>2</td>
<td>Follow Standard of procedure (SOP) for NG tube insertion</td>
<td>46.2 %</td>
<td>46.2 %</td>
<td>3.8 %</td>
<td>3.8 %</td>
</tr>
<tr>
<td>3</td>
<td>Follow Standard of procedure (SOP) for suctioning</td>
<td>50.0 %</td>
<td>34.6 %</td>
<td>15.4 %</td>
<td>0 %</td>
</tr>
<tr>
<td>4</td>
<td>Follow Standard of procedure (SOP) for</td>
<td>50.0 %</td>
<td>50.0 %</td>
<td>0 %</td>
<td>0 %</td>
</tr>
</tbody>
</table>
Table 3. Challenges faced by the novice nurses

<table>
<thead>
<tr>
<th>Knowledge related challenges</th>
<th>Skills related challenges</th>
<th>Other challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Knowledge about medications</td>
<td>1. Ventilator management</td>
<td>1. Workload</td>
</tr>
<tr>
<td>2. Communication with patients</td>
<td>2. Swan ganz catheter management</td>
<td>2. Uncooperativeness</td>
</tr>
<tr>
<td>3. Communication with attendants</td>
<td>3. CVP monitoring</td>
<td>3. Favourism</td>
</tr>
<tr>
<td>5. Lack of knowledge about hospital policies</td>
<td>5. Blue code</td>
<td>5. Medication receiving from pharmacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Staffing shortage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Overcrowding of patients</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Assign patient in the early days of job</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Communication gap between staff</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Personal Stress</td>
</tr>
</tbody>
</table>

Fig. 1: Types of challenges

IV. DISCUSSION

In the rapidly evolving health care system, competency remains a major constituent of providing standard nursing care worldwide. Competency is defined by the Australian Nursing and Midwifery Council (2005, as cited in Levett-Jones, Gersbach, Arthur & Roche, 2011), as the sum of knowledge, skills, attitudes and values that accentuate effective performance in clinical practices. As the career of a nurse evolves, she becomes more competent and critical thinker. Benner Model explains that how competency develops over the years as the result of experience. According to Benner model of clinical competency (1984, as cited in Saver, Habel, & Alfaro-LeFevre, 2013) new graduates’ passes through 5 stages to become expert nurses that are, novice, advance beginner, competent, proficient...
and expert. In this model, first stage is novice, which refers to new staff, having no experience of the situation where they are projected to perform and mostly rely on others for their acts and decisions (Saver, Habel, & Alfaro-LeFevre, 2013). The journey from novice to expert occurs in a stepwise manner with time and experience. However, the development to an advanced level needs certain knowledge and skills, which if not provided, may cause one to stagnate at a level and hinder their development (Saver, Habel, & Alfaro-LeFevre 2013). Furthermore, Chandler (2012) stated that the being a novice is the most stressful, perplexing and appalling period of a novice nurse career. During this critical period of professional development novice nurses face many challenges due to gaps in knowledge and skills, which may lead to early termination of their nursing careers.

As stated by Jewell (2013) that new graduates confronted self-doubt and inadequacy while transition from student to a professional nurse or shifting to new work environment. In addition, Duchscher (2008, as cited in Jewell, 2013) described that feeling of discouragement and exhaustion that may lead to burnout, is the most prominent feature of novice nurses in the first year of their career. Thus, support and guidance is required to novice nurses as per their legitimate needs in order to make them learn how to apply theoretical knowledge into the clinical practices and providing safe patient care. According to Saver, Habel & Alfaro-LeFevre (2013), Benner model of clinical competency is the most widely used framework for addressing nurses' needs at different stages of professional development, which helps the nurses to comprehend how expertise develops, resulting in creating a supportive work environment. Jewell (2013) has described three (3) phases through which a novice nurse passes during their transition period and each phase is characterized by various challenges and difficulties. The first 3 to 4 months is the "honey moon" phase, during which main aim is to complete the tasks on time and do as directed. In this phase the novices realize that they are underprepared for their clinical practices (Barton et al., 2005 as cited in Jewell, 2013). This stage is considered as the most stressful period of a novice nurse's career and may result in quitting the job which may have a negative impact on both nursing profession and health care. The next four to five months is the "being stage" during which they realize overwhelmed but feeling more comfortable to work independently if equipped with support & guidance. After successful completion of the first two stages, a novice nurse enters into the third stage termed as "knowing phase", which lasts for the final three to four months of their first year and now they become more independent and confident in their clinical practices (Duchscher, 2008 as cited in Jewell, 2013). Besides, the challenges experiences by the novice nurses, the advent of technologies, increasing patient awareness and a shortage of health care providers has made working in the health care environment more challenging and stressful. In this challenging working environment the novices often feel isolated from nursing team as everyone remain busy in their own work and novice nurses are often ignored which may place the patient at risk.

V. CONCLUSION

It is evident that before entering into the clinical practices the novice nurses must be well prepared through a comprehensive orientation program, which will help in building a strong foundation for their professional growth. It will not only provide opportunities to the novice nurses for professional growth & learning and enhancing their competency but will also results in nurses’ retention besides strengthening nursing profession by ensuring the provision of safe and quality nursing care.

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Application of Katharine Kolkaba Comfort theory to nursing care of patient

Afsha Awal khan
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I. INTRODUCTION

Caring is in practice since existence but caring as profession named Nursing was scientifically Coined by the founder of modern nursing who in her writings “what it is and what it is not” declared the boundaries along with its Constitutional elements. Those elements with appropriate association not only revealed the nature of caring dogma it also shows that it is doing something base on thinking something or in simple words this is practice rely on theory.

According to McCrae, (2011) For the sake of assuming valuable status of profession in society nursing struggle to legitimate its position by generation and application of theory. Nursing literature is rich regarding theory practice association. although constant body of argument, counter argument and lack of agreed conclusion regarding nursing theory creates a bit confusion among nurses but ideally nursing theory should set the code of every day practice of nurses(Giltinane, 2013) as lack of a valued unique contribution nurses make to health care based on a specialized body of knowledge will portrayed nursing role as subordinate to doctor (Mccrae, 2011)

Eminent nurses’ theorist, scientist, Researchers, Clinicians, Educators and intellectual intelligentsia aid evidence to different perspectives of theory practice link. Some unanimous convincing narratives argue that the relationship is reciprocal and according to (Mckenna, 2005) Nursing theory takes its origin from practice, than reverse to practice for testing and at the end become set to guide the practice.

II. PURPOSE

The desire behind this paper is an effort to explain the practical application of nominated theory to critical scenario of patient I cared in my clinical practice.

III. CLINICAL SCENARIO

My patient was Mr. X admitted to our unit about 10 days back. Mr. X was 18 years old FSc student and was injured in a bomb blast injury. He was accompanied by his sisters and mother at the time of admission he was operated on day first in order to save his limb but unfortunately surgery does not work and consequently his limb amputated for the sake to save his life. now Mr. X was well oriented and hemodynamically stable, wound dressing was intact and dry, He was afebrile but was complaining pain 5/10, he was used to realize his condition. He was looking anxious, unable to cope this tragic event and was denying his condition.

Possible concepts derived from scenario:
Physiological discomfort, anxiety, Pain, Fear, Image disturbance, traumatization.

Application of appropriate nursing theory:
Theory of comfort devised by Katharine Kolcaba is suited best to me for application to care of my patient.

Introduction to theorist:
Born in 1965 atCleveland, Ohio, isgerontology specialist nurse and theorist.Kolcaba developed a middle range theory where she operationalized the comfort as an outcome of care and later on her theory has been tested in numerous interventional studies (Parker & smith, 2010,)comfort theory is developed in 1990s and is up to date in application to current health care industry as it is continues to change and have last updated in 2007(March & McCormack, 2009)

Description of comfort theory:
Conceptual proposition of comfort theory:

According to (Peterson & Bredow, 2009, pp.197) Kolcaba comfort theory have following propositional statements which links concepts:

1. **Health care needs**: nurses determine comfort needs of patients specially those not met with existing settings.
2. **Nursing interventions**: nurses plan interventions and coordinate their activities to fulfill the unmet comfort needs.
3. **Intervening variables**: nurses take into account intervening variable while planning interventions and determination probability of interventions success.
4. **Enhanced comfort**: nurses attained the outcome of enhanced comfort with implementation of appropriate interventions in caring way.
5. **Health seeking behavior**: by attaining state of enhanced comfort patient, family and nurses further unite their ties for health seeking behavior which cultivate more comfort.
6. **Institutional integrity**: enhanced comfort maximizes health seeking behavior and increment in health seeking behavior results in better institutional outcomes.

Taxonomic grid of comfort theory:

During concept analysis kolcaba review literature of different discipline related to concept of comfort including medicine, nursing, psychology and English. During the development of the comfort theory, Kolcaba conducted a concept analysis of comfort that examined literature from several disciplines including nursing, medicine, psychology, psychiatry, ergonomics, and English (Peterson & Bredow, 2013). She elaborates three existing forms of comfort which are relief, ease and transcendence and explain that if nurse freed a patient from pain by administering analgesia the patient sense comfort in relief sense, if the patient anxious issue is resolved he enjoy comfort in ease sense and if patient is rising of the discomforting challenges through rehabilitation he sense comfort in form of transcendence (March & McCormack, 2009).

According to (Kolcaba, 1991) three nursing theories were used to describe three distinct types of comfort: Relief was derived from the work of Orlando, ease from Henderson while Transcendence was adopted from Paterson and Zderad (Parker & Smith, 2010, pp.390). Kolcaba further elaborate the three existing form of comfort in context to Physical, Psych spiritual, Environmental and Sociocultural environment (March & McCormack, 2009).
Application: How to be a nurse?

According to (Chandra, Raman & Kolcaba, 2016), comfort theory is best comprehended when applied in partition. At first part, nurses assess the physical, psychospiritual, sociocultural, and environmental needs of patients and thus enable patients to engage in health seeking behavior. This is the second part of comfort theory by ensuring enhanced comfort. Engagement in positive health seeking behavior ultimately leads to better outcomes which is linked to institutional integrity in terms of decreasing hospital stay, cost effective care, and better satisfaction.

Care of Mr. X according to Kolcaba model:

After assessing comfort needs of Mr. X, the following nursing intervention were planned:

1. Pain reduction: (physical comfort)

   Prescribed medication was administered to control pain. Non-pharmacological interventions were implemented for pain control. His position was changed to release pressure of bony prominence and a light sand bag was placed on the residual limb for the sake of minimizing muscle spasm and improving comfort level.

2. Care to promote acceptance of change or loss strengthening ability to adjust to change lifestyle and relieving anxiety (Psychosocial comfort)

   Mr. X was keenly observed on his usual coping mechanism. He verbalized reduction in pain and was mobilized with help. He was now used to touch his residual limb confidently and was looking relaxed. Denial, anger, and depression feeling was acknowledged as normal during the process of new adjustment. It was realized that disturbance in body image cause anxiety and people use defense mechanism to deal with it effectively but it should not affect self-esteem. Patient was encouraged to disclose social interpersonal conflicts which may arise. Mr. X was encouraging for his own decision and participation in care. Patient was gradually exposed to body changes and was reassured about strengths and resources available. Patient was encouraged to describe self-ideal and counsel about self-acceptance.

Outcomes:

In response to given intervention, Mr. X was recovery was enhanced now he was actively participating in care related activities. He verbalized reduction in pain and was mobilized with help. He was now used to touch his residual limb confidently and was looking relaxed. According to (Kolcaba, 1991), it is the ease state of comfort. It results in his fast recovery and reduce hospital stay which as mentioned by Kolcaba leads to health seeking behavior and institutional integrity.

IV. Conclusion

Katherine Kolcaba’s theory of comfort was applied in clinical setting to the care of a young surgical patient successfully. Its application to integrate comfort in patient care was excellent and result oriented. The strength of theory is that it covers fulfilling all needs of surgical patients in holistic way. Pediatric patients, comfort care bundles can be identified and delivered as per each child’s needs and interest.
Care of Mr. X according to Kolcaba model:

Mr. X was operated on day first in order to save his limb but unfortunately surgery does not work and consequently his limb amputated for the sake to save his life. Now Mr. X was well oriented and hemodynamically stable, wound dressing was intact and dry, He was alert but was complaining pain 5/10, he was used to realize his condition. He was looking anxious, unable to cope this tragic event and was denying his condition.

1. Pain reduction: (Physical Comfort)
2. Care to promote acceptance of change or loss strengthening ability to adjust to change lifestyle and relieving anxiety (Psychosocial comfort)

He verbalized reduction in pain and was mobilized with help. He was now used to touch his residual limb confidently and was looking relax which according to (Kolcaba, 1991) is the ease state of comfort.

Mr. X was recovery was enhanced now he was actively participating in care related activities.

It results in his fast recovery and reduce hospital stay which as mentioned by kolcaba leads to health seeking behavior and institutional integrity.

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Anti Malicious Threshold System

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ABSTRACT- WSNs are spatially distributed autonomous sensors to monitor physical or environmental conditions such as temperature sound pressure etc. They are highly prone to malicious attacks and security threats[12][13] since their structures are not predetermined. Malicious attack on the sense that it makes the sensor nodes to drop the packets of data when moved from one node to another. This will surely degrade the performance of the whole system. Another major issue is to distinguish malicious attack from normal packet loss. Most cases we fail to realize malicious attack from normal packet loss. In order to overcome that problem we adopt a new method using threshold value called Channel Aware Anti Malicious Threshold System(CAMTS).

INDEX TERMS- WSNs; malicious; packet loss; CAMTS

I.INTRODUCTION

As a promising area in the future the wireless sensor network helps us to gather information from remote areas since they are sparsely deployed. The structure of WSNs are not predetermined. The size of the WSNs can be varied from grain to medium carton box. The advantages of WSNs mainly in military, health care and in environmental scenarios. In military applications it helps to collect information on mine bombs pitted by enemy army. It is easy to find the accurate target of enemies in war zone. Biological and chemical attacks also can be monitored. The intrusion of enemy troops during night can be determined by using thermal variations on the human bodies with the help of WSNs. Since it does not have a predetermined structure, it is easily prone to attacks. Meanwhile neighboring nodes will not be aware of the attack. Thus pack forwarding will be done while it is under the attack and the amount of packet drop also will be high. The sensor nodes[10][11] in hostile conditions should be considered serious. Since it is in hostile environment the packet loss can be occurred not only due to malicious attack but can be occurred due to bad and unreliable channel conditions.

II. METHODOLOGY

Consider 15 data packets for the time being and nodes; source node N_s, node N_a ,node N_b ,destination node N_d. Source node transfer data packets to destination node through intermediate nodes N_a and N_b and N_b performs better than a during normal packet transfer. If N_a transfers 8 data packets to N_d while if N_b transfers only 3 packets to N_d then we can conclude that the performance of N_a is greater than N_b and N_b has undergone a malicious attack.

The method can be done as considering source node N_s, destination node N_d and intermediate nodes N_a, N_b, N_c, N_d etc. The value of intermediate nodes can be determined by DFR-Data Forwarding Ratio. As the amount of packet forwarding from one node to another is high that is with less packet loss then the DFR is high and node with high DFR can be considered as dependable node for the data forwarding from source to destination.

The performance can be evaluated as Reputation Evaluation Reputation Propagation Reputation Integration with 50 numbers of nodes. The proposed method works on the threshold value (probability value) 21 in reputation evaluation. This value is obtained by the graph coinciding point of normal packet loss and malicious packet loss to probability.
Most of the related works are on to lessen the effect of malicious attack or to give an alarm on malicious attack. The related works can be biased into acknowledgement based and neighbor surveillance based. In acknowledgment based; Xiao et al. [1] introduces a method where it selects randomly intermediate nodes significantly increases the resilience against attacks. This scheme could be used to transfer ordinary packets, but when the source node generates a very important packet, it should be delivered to the base station through multiple paths. Marti et al. [2] throughput: this is the percentage of sent data packets actually received by the intended destination. False positives occur when the watchdog mechanism reports that a node is misbehaving. Only initial work has taken to detect the malicious nodes. No solution for their problem. Watch dog is ineffective to cooperative attacks. Liu et al. [3] The 2ACK technique is based on a simple 2-hop acknowledgment packet that is sent back by the receiver of the next-hop link. How to derive the triplet information so that the 2ACK sender and the observing node are informed of such information. Knowledge of topology of the 2-hop neighborhood may be used. Ozdemir et al. [4] Protocol RDAT improves the reliability of aggregated data by evaluating sensor nodes and data aggregators via appropriate functional reputations. Consumption of energy is not even in the whole network. The protocol is simple having high protocol cost, and difficult implementation. Djahel et al. [5] The packet dropping attack, which is known as one of the most destructive threats in MANETs, and illustrates in depth the different schemes used by adversaries targeting on both reactive and proactive protocols. Most of the proposed solutions are built on a number of assumptions which are either hard to realize in a hostile and energy constrained environment like MANETs. Li et al. [6] SCM is able to detect attackers acting as a team. Unlike the version of Watchdog extended to cooperative attacks, SCM does not require trusted nodes (thus no additional hardware investment) and involves only local communication (thus more efficient). It fails when more than two malicious nodes are colluding in a row. For example, three malicious nodes one next to another act as a team to drop packets along a data communication path. Hao et al. [7] By utilizing the game theoretic approach, we analyze the collusion in selective forwarding attacks. The selective forwarding attack is launched from inside of the network. Joshi et al. [8] This system has a powerful attack control, which is one of the necessary conditions to guarantee the data security. Once the activator defines the keys to the nodes, the priority will be generated automatically. Ambiguous collision Receiver collision Limited transmission power False misbehavior report Collusion Partial dropping.

IV. DESIGN GOALS

A. Accurate detection: The detection of malicious nodes must be accurate and should be false proof. The forwarding of the data packets from source to destination is through the intermediate nodes. In some cases we may falsely accuse normal nodes as malicious nodes. This may lead to the loss of well working nodes. This may result in no cost effect.

B. Improvement in Packet Delivery Ratio: The packet delivery from one node to another especially among intermediate nodes must be high. The nodes with high DFR will be allowed to participate in data/packet propagation process from source to destination. With high DFR/path[14][15] it shows that the nodes are least prone to malicious and highly dependable.
IV. EVALUATION PROCESSES

A. REPUTATION EVALUATION

We forward the data packets to all 50 nodes. Thus if packet loss from one to another exceeds 21 then the node that transferred data can be considered as malicious. By this method we find DFR value. That is if the amount of data forwarding to next node from a node is high from the data received, then the DFR is good and that node is considered as good for communication. Each node has unique value of DFR and they assigned as $+\delta, -\delta, \lambda$. 

$\delta$ - adjustment factor; +1

$\lambda$ - punishment factor; -1

$r^1_{i,j} = \begin{cases} 
+\delta & \text{if packet loss is less than probability value 21} \\
-\delta & \text{if packet loss slightly high than probability value 21} \\
\lambda & \text{if loss is very much higher than probability value 21}
\end{cases}$

This information is send to neighboring nodes of every node.

B. REPUTATION PROPAGATION

The second hand reputation is done for source and destination nodes. Along with adjustment factor, the values are also distributed to the neighbors. The second hand reputation is calculated as reputation value/score of source node:

$$\frac{\text{sum of reputation scores of 4 neighboring nodes}}{\text{number of neighboring nodes}}$$

That is if 2, 5, 8, 13 are neighboring nodes of source node(say for the time being) and they have their own of reputation scores[9]. To find among them, the honest and dishonest nodes, we calculate the second hand reputation scores. We take node 8. Then to find whether it is honest/dishonest

If calculated value is less than $r^2_{i,j}$ (which is first hand long term reputation score) then it is honest.

If calculated value is greater than $r^2_{i,j}$ then it is dishonest.
\[ r_{ij}^2 = \frac{\text{sum of reputation scores of 4 nodes}}{\text{number of nodes}(2.5 \& 13)} r_{ij}^1 + \frac{\text{sum of reputation scores of 4 nodes}}{\text{number of nodes}(2.5 \& 13)} \alpha r_{ij}^1 \]

where \(r_{ij}^1 = 1\).

In order to reduce the malicious nature of the dishonest nodes we multiply a factor called penalty factor \(\alpha\) were the value of \(\alpha\) is 0.6. As the negativity of the malicious nodes get reduced to normal value these nodes can be made to participate in data transfer from one node to another in future.

### C. REPUTATION INTEGRATION

Reputation integration is a combination of reputation evaluation and reputation propagation. The reputation table is updated on the basis of the first-hand and second-hand reputation scores.

\[
R_{ij}^1(t) = \sigma r_{ij}^1(t) + (1-\sigma) r_{ij}^2(t)
\]

\(\sigma = 0.75\), weight factor.

### V. MALICIOUS NODE IDENTIFICATION

Even after nodes undergone these processes there still might be nodes with malicious behavior. In order to identify them we introduce alarm reputation value \(R_a\). If calculated value of nodes is less than \(R_a\) then it is purely malicious. If calculated value is greater than \(R_a\) then it is normal node.

\(R_{ij}^1 > R_a\) – normal node

\(R_{ij}^1 < R_a\) – highly malicious node (therefore completely avoided)

### VI. RESULTS

The results are obtained with the help of NS2 (Network Simulation – Version2) software. The result shows that with the Channel Aware Anti Malicious Threshold System the data propagation delivery of packets from source to destination during normal mode and under malicious attack mode are almost same and can be achieved as former.
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Human Resources Management and the Role of Organizational Communication in Automotive Company in Jakarta, Indonesia

Dr. Syahruddin Hattab, M.Si

Abstract- This study aims at discussing human resources management (HRM) and the role of organizational communication in one automotive company located in Jakarta. Methods used to collect the data is by undertaking direct observation and interviews with the employers and the employees of the company. The study found that HRM has been given large attention by the Toyota-Auto 2000 company by establishing annual planning, recruitment and selection, training, development and job performance analysis, and promotion, transfer and resignation. The employees of the company were also found to be satisfied in their jobs. The reason for this is because this company has well established human resources management programs on one hand and it is because of the good communication organized in the company on the other hand. Open and transparency communication between the employers and the employees have made the company able to motivate the employees and increase the profits as well as the company’s value to sustain in the tight completion business. The company conducted a strategy to take advantage of employees in achieving corporate goals and the employees also receive compensation in the form of wage salary in accordance with the employee's performance and reward for employees who excel in their work. If the employees especially the sales persons of the company have not been able to reach their sales target, the company will not directly give penalties to its employees. However, much remain to be done as the company faces tight competition to other automotive companies located in Jakarta.

Index Terms- HRM, organizational communication, automotive company, employers and employees.

I. INTRODUCTION

Any business activities at least have two objectives. The first is to maximize profits and the second is to sustain the value of their business activities. To achieve these objectives, it does not only need to satisfy their customers, but it also needs many efforts to increase the employees’ social welfare. These suggest that employees and customers are the two things that cannot be underestimated by the companies. Employees, in particular, play a major role in running the company’s life. If the employees have high job satisfaction and work motivation, these conditions are no doubt increasing the company’s performance as well as generating profits for companies, vice versa. For these reasons, a good human resources management is a must for any companies to maximize their profits and the value of the companies.

Of many ways to motivate companies’ employees to have a great concern to increase their productivity is by providing a good salary and incentives. By providing a reasonable salary and incentives, employees are able to obtain their job satisfaction. This view has been advanced in the literature. As Robbins and Judge (2009: 118-119), for instance, stated that employees job satisfactions do not merely depend on work itself, advancement opportunities, and supervision, but it is also affected by the salary and incentives. This indicates that sufficient salary is not a necessary condition to achieve employees’ satisfaction, but it is a must.

However, to provide a reasonable salary for the employees, the company must have a good quality of human resources management (HRM). This, for example, can be done by establishing training and human resources development unit in a company. By having this unit, the employees can be easily trained and educated to increase their productivities and skills. In addition, the employees of company will be able to work and live well within a social group dynamic. They can also become creative, innovative, empathetic, professional and have self-integrity, high motivation, as well as they can enjoy their works satisfactorily.

Apart from the training programs, job performance is also needed by the company. One of the factors that cannot be forgotten in increasing employees’ job performance is communication within the company. Without a good organizational communication, the available resources cannot be managed properly. This will further cause performance becomes deteriorating and the process of achieving goals in a company cannot be maximized. Hasibuan (2001) defined job performance was created if there is job satisfaction. This job satisfaction can be seen from employees’ attitude and passion towards their jobs. It is also reflected from the work ethic, moral, discipline and work performance of the employees.

Like Hasibuan (2001), As’ad (1995) stated that job performance is closely connected with the attitude of employees toward work itself, the work situation, cooperation between leaders and employees. Whilst in terms of job satisfaction, As’ad (1995) defined it as the general attitude towards factors of work, adjustment and individual social relationships outside of work. Therefore, the assessment towards human resources management in a company and the influence of communication to the performance of a company are needed to be studied.

This paper aims at describing the human resources management and the role of communication in a company towards the company’s performance taking automotive company
Toyota – Auto 2000 as case study. The company is located in Slipi, West Jakarta and it sells four-wheeled vehicles (sedans, minibuses and trucks). The total number of employees in this company are no more than 70 persons and it is mostly sales persons. However, before discussing the above objective, a brief literature review on human resources management, communication and job satisfaction are given in section 2 as the background. Section 3, then, discussed what have been done by the automotive company in its human resources management. Section 4 highlights the role of communication towards the company’s performance. Finally, concluding remarks are drawn in section 5. Note that, the sources of data were from secondary sources published by the automotive company located in the capital city of Jakarta. A brief visit to the company and interview to manager, employers and employees of the company were also conducted.

II. A BRIEF LITERATURE REVIEW

Human resources management as usually abbreviated as HRM has been defined in many literatures. Of the many definitions of HRM, there are at least three relevant references that are worth to be given here. According to Henry Simamora (2005), for instance, HRM is defined as the efforts to utilize, develop, assess and response to services and management of individual members of the organization or group work. In HRM, it also includes the design and the implementation of planning, personnel arrangement, employee development, career management, job evaluation, compensation of employees and labor relations.

However, Panggabean (2010) defined HRM as the process of planning, organizing, leadership selection and the control towards organizational activities related to job analysis, evaluation and job description, procurement, development, compensation, promotion as well as the termination of employment in order to achieve the goals set by the organization. Whilst Achmad S. Rucky (2009) defined HRM as the appropriate and effective implementation in the process of acquisition, utilization, development, and personnel maintenance owned by the organization effectively in order to achieve the optimal level of utilization of human resources by the organization to achieve its goals. Therefore, definitions of HRM have been many and it depends on the context of the types of organization. However, in general HRM is defined as the way to influence human resources to conduct any activities towards the objectives of the organization.

In terms of the definition of organizational communication, this terms has no single definition. Purwanto (2003), for example, defined organizational communication as a process of communication that uses language or symbols as media to transfer messages from the sender to the recipient via the communication process in order to obtain a substantial response for an organization. Whilst, Katz and Khan as quoted by Thoha (1999) defined communication as a social process that have relevance to the functioning of the widest in any group, organization or community. Umar (2002), however, defined communication as an activity undertaken by one or more people, such as the sharing and receiving messages. Thus, communication in a company is important for employees and employers to share views and opinions as well as discuss the company problems and solutions.

Unlike the above two definition of HRM and organizational communication, job satisfaction is defined as a positive feeling about a job, resulting from an evaluation of its characteristics. Job satisfaction is the individual feeling. The more aspects of the works is fulfill expectedly, the higher will be the perceived level of satisfaction, and vice versa. However, Ivancevich (2008: 12) argued that employees’ satisfaction does not automatically improve the productivity. But, if the employees feel unsatisfied towards their jobs, this tends to lower productivity. The employees will also be more often absent and produce lower quality.

Other definition of job satisfaction which is worth to be mentioned is the definition highlights by Newstrom (2007: 204) in that he stated that job satisfaction is a set of favorable feeling and emotions with which employees view their works. Whilst Davis (2002: 501) defined job satisfaction is a psychological atmosphere of pleasant or unpleasant feelings towards their job.

III. III. HUMAN RESOURCES MANAGEMENT IN AUTOMOTIVE COMPANY

As mentioned at the outset that the automotive company under study is Toyota – Auto 2000 located in Slipi, West Jakarta. This company has employees no more than 70 persons and they are mostly sales persons. The study found that the automotive company considers the HRM is important to achieve the objectives and goals of the company. This company considers HRM as integrated capabilities of the intellect and physical power of the individual in the company. Also, it is a way to manage relations and role of resources (labor) owned by individuals effectively and efficiently. This company argued that every human being is not a machine and they cannot be viewed simply as business resources that can be used in order to reach a common goal of the company, employees and the community. Communication in this company between the employers and employees are critical in making HRM works.

The above views are in lined with what has been said by Panggabean (2010). According to Panggabean (2010), activities in the field of human resources need to be viewed from two perspectives, namely, the work and the workers. In terms of the work, it should be viewed in terms of job analysis and job evaluation. However, in terms of workers, it should be viewed as activities that include procurement of labor, performance appraisal, training and development, promotion, compensation and termination of employment.

In addition, the company was also argued that HRM has relationship with the design and the system implementation not only for planning and formulating, but it also includes good employee development, career management, job evaluation, compensation and labor relations. In other words, human resource management involves all the decisions and management practices that directly affect and related to human resources.

To have a well established HRM, it is argued that the company needs to have the objective of HRM. The purpose of HRM’s objective is to make the organization becomes an effective working unit. The reason is simply because HRM is a process of facing and dealing with the various problems that
happen to employees, officers and other human resources which can influence and support organizational activities to achieve its intended purpose. As Stoner (1996) suggests that human resource management is an ongoing procedure that aims to supply an organization or company with the right individuals to be placed in the position and the right position when the organization needs it.

There are at least four objectives of HRM that has been given attention by a company. These four objectives are as follows. The first is the organizational objectives. This aims to recognize the existence of human resources management to contribute to the achievement of the effectiveness of the company. This is done by establishing a human resources department to help the managers in managing the performance of employees. Thus, the human resource department only help managers in dealing with matters relating to human resources.

The second is functional objectives. This aims at maintaining the contribution of the department at a level appropriate to the company's needs. It is argued that there will be no value if the HRM has its own criteria which are less than the company's needs. The third is the social goals. This aims to be able to respond ethically and socially to the needs and challenges of society through actions to minimize the negative impact on the company. Finally, the objective towards personal interest. This aims to assist employees in achieving its objectives. The objective minimally is to increase the individual contribution to the company. This suggests that personal goals should be considered if the employee must be maintained, retired or motivated. Otherwise, job performance and employee satisfaction can decrease and the employees can leave the company.

The function of HRM is argued by the automotive company to be similar as the function of management. There are at least four aspects that need to be given attention in HRM. These function are Planning, Organizing, Controlling and Actuating which is widely known as POAC. This argument is in line with the views suggested by Simamora (2005) and Panggabean (2010). The four aspects of management functions that are taken by the company are as follows. The first is planning which means as a preparation and selection of workers. In the process, there is a need to have planning for human resources in undertaking the variety of jobs that might come up and needed in accordance to the company needs. This process is done by taking into account the availability of jobs, the amount of employees, timing and so forth. There are at least two factors that are argued needed to be considered in the preparation process. These factors are the internal factor that includes the number of the employees needed, company’s structure and the like, while the external factor includes the labor regulation, employees’ condition and so forth.

The second is the process of recruitment and selection. The recruitment of employees is a process to seek candidate or new employee to fulfill the company needs. To do optimize this process, there is a need to have job analysis to describe any type of job needed by the company. While the selection process deals with the process to find new employee that is suitable to the vacant job position available. In this process, the automotive company accepted many job application, this application is then sorted into two groups. One group is those applicants that are suitable with the vacant position required and other groups are for those applicants that are not required by the company. After this process completed, the company organized written tests to the first group. Those who are able to get through from the test are the interviewed and proceed to final selection process.

The third is training, development and the performance evaluation. In terms of training and development, the company implemented a leadership development program with the aim of improving employee performance, especially in terms of service. One of the main focuses of this company is selling. The company implemented mentoring system to new employees with methods of mentoring by more experienced senior in sales. The training includes methods how to find customers, how to interact and so on until they are able to sell the cars. In doing this, the company determined a target system to each of its sales persons. The company also strengthen a corporate culture based on performance. Superior behavior is considered as a core competency, this was combined with technical competencies used as the basis for the development of employee competence.

There are three things undertaken in this stage. The first is development and evaluation of employees who work in companies. The employees must to master the duties and responsibilities. For that, they are given a briefing to make them able to handle and skillful in their fields to further improve their performance. The second is by granting compensation and protection of employees. This reward is given to those employees that regularly have work contribution to the company. In addition, compensation is also given. But the compensation given should be in accordance to the labor market conditions that exist in the external environment. If not, there will be problems in the future and that will have a negative impact on the company itself. While protection is also given to employees in order to carry out its work productively so that the performance and contribution of these workers can keep up from time to time.

The fourth aspect of management function is promotion, transfer and resignation. In this management function it includes promotion, separation, termination, voluntarily dismissal and resignation. Promotion is a type of transfer that includes the reassignment of an employee in a position higher than the previous position. Separation, or often called the dismissal is the temporary or non-definitive transfer of an employees’ salary. This is done generally to reduce the excess burden of labor costs and the company's financial problems. Termination is an employee separation of the company due to company violation or due to the lack ability of employee to show sufficient performance to their jobs. Voluntary dismissal is taken if an employee has his/her own initiative or willingness to terminate from his job. Finally, resignation is given to those employees who have completed the maximum work period in the company. This generally is called retirement or a pension.

However, as there have been latest developments that consider the human resources as human capital or assets of the company or organization, the automotive company under survey provide opportunity to the employees to undertake training and education programs. These methods are expected to improve the quality and the skills of the employees. This is in line with the view stated by Harris and DeSimone (1992: 2). They stated that human resource development can be defined as a set of systematic and planned activities designed by an organization to
provide its members with necessary skills to meet current and future job demands.

In doing this the company develops knowledge management programs. This programs is specifically intended to enhance the human capital excellence in the company. The activities of the program include Knowledge Sharing, mentoring and other activities related to the knowledge of individuals and groups. This activity is expected to strengthen the ability of the human capital of the company to increase the profit and the value of the company.

Moreover, in improving the competence of employees, the company provides the opportunity to employees to grow as well as providing competitive compensation. This process involves all activities related to the performance management cycle, from planning, periodical performance review and appraisal at the end of the year. In every year, the company sent several of its sales persons to participate in an event that has become a program for the sale of PT Astra International Tbk. The program is by giving the employees opportunities to have vacation abroad. Therefore, the human resources management in the automotive company in Jakarta has been well organized. In this company activities undertaken is not only by facilitating the employee to have the knowledge, skills and attitudes required in handling the current job or future, but it also concerned to the aspects of career, training and educated the employees to improve their social welfare and sustain the value of the company.

IV. THE ROLE OF COMMUNICATION

Communication in the company or organization is a must. Through organizational communication the employees will be able express the problems faced by the company. This further leads to the problem solutions as well as creating conducive working environment. Through communication, both employers and employees are able to promote the products produced to consumers. Organizational communication also involves forms of interpersonal communication and group. In short, organizational communication is important to be taken by the company. This will lead to optimizing the flow of messages in a company.

It is no doubt that the automotive company under survey there is a hierarchy between superiors and subordinates. The communication between superiors and subordinates should be a two-way communication or mutual communication. This is important in order to smooth the work being done in cooperation to achieve the goals, whether an individual or group to achieve a goal the company or organization. Cooperation may include social and cultural relations. This communication can increase the value of the company.

In addition, it was also found that communication undertaken by superiors has made subordinates in this company motivated and further it can improve work performance of the employees towards the company’s objectives. However, the result of communication depends on the needs and related to skills and tasks that must be implemented. If communication can be well implemented in the company the employees of the company can work together easily as through communication the employees will know what to do, how well they are doing and what can be done to improve performance if it was below standard.

A good organizational communication in the automotive company has made to job satisfaction. In addition to job satisfaction, communication has created other work attitudes such as job involvement, and organizational commitment. This work attitude contains positive or negative evaluations owned by employees about the environmental aspects of their work. Whilst job satisfaction can be used as a benchmark of employees effective orientation against their role in the post they at the time. As Greenberg (2008: 221) stated that job satisfaction is positive or negative attitudes held by individuals to word Reviews their jobs. This explained that job satisfaction is a positive attitude towards work, while it becomes negative attitudes towards work closely if the employees are not satisfied.

However, job satisfaction is also influenced by motivation. This suggests that employees who are highly motivated in carrying out its activities are assumed they are satisfied, while low motivation can make employees discouraged to work productively. Motivation is able to create a work of passion, and make employees are happy doing their jobs. When a person is motivated, he will try to do his/her best to his/her jobs. However, job satisfaction will arise when employees really feel secure, stable and their jobs are attractive.

V. CONCLUDING REMARKS

Human resource management (HRM) has been given large attention by the Toyota-Auto 2000 located in Slipi West Jakarta. Of the many HRM ways undertaken by the company is by establishing four ways. These are through annual planning, recruitment and selection, training, development and job performance analysis, and promotion, transfer and resignation. The employees of the company were also found to be satisfied in their jobs. The reason for this is because this company has well established human resources management programs on one hand and it is because of the good communication organized in the company on the other hand. Open and transparence communication between the employers and the employees have made the company able to motivate the employees and increase the profits as well as the company’s value to sustain in the tight completion business.

The company conducted a strategy to take advantage of employees in achieving corporate goals and the employees also receive compensation in the form of wage salary in accordance with the employee's performance and reward for employees who excel in their work. If the employees especially the sales persons of the company have not been able to reach their sales target, the company will not directly give penalties to its employees. However, much remain to be done as the company faces tight competition to other automotive companies located in Jakarta.

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Principles and methods of phonetic teaching At Teaching Chinese as a foreign language

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Abstract - Phonetic teaching is the foundation of teaching Chinese as a foreign language. In the face of Chinese beginners, there will be a period of time to learn pinyin, then correcting pronunciation will also exist throughout the learning process, if these learners cannot grasp the Chinese pronunciation, learning will cause great and bad the influence on Chinese vocabulary, grammar, learners will have a low confidence to study Chinese. As a qualified Chinese teacher, we should master the necessary grammar knowledge, there should be some targeted teaching principles and methods.

Index Terms - Teaching Chinese as a foreign language, Pinyin principle and method

I. INTRODUCTION

Now with the global Chinese fever, the importance of teaching Chinese as a foreign language is increasingly prominent. Phonetic teaching is of vital importance in the whole Chinese teaching, pronunciation is the first window to contact Chinese learners, its importance is self-evident. For the importance of phonetic teaching, Mr. Zhao Yuanren mentioned that foreign language learning includes three important parts: pronunciation, grammar, vocabulary, of course, Chinese study should also be carried out in accordance with the order of these three steps. The pronunciation is also the most important as well as difficult part, pronunciation is not correct, the grammar is wrong, the word is wrong. [1] Chinese phonetic recording is presented in Chinese pinyin.

Chinese syllable consists of three parts: initial (sheng mu), finals (yun mu) and tones (sheng diao), compared with Indo-European, its main characteristics are followings.

1.1 No consonant cluster.

There are two or more than two vowels connected in English, but in Chinese this compound consonants is nonexistent. In Chinese, zh, ch, sh, -ng etc. just said a consonant phoneme with two letters, not a cluster. Chinese initial is made up of consonants, usually at the beginning of Chinese syllables, consonants are not necessary, such as an (an).

1.2 Vowel dominance

It is not necessary to exist consonants in Chinese syllables, but there must be vowels.

1.3 Tones

Chinese is a tonal language, Chinese tone is divided into Yin Ping (first tone), Yang Ping (second tone), Shang Sheng (third tone), Qu Sheng (fourth tone). Its role is to distinguish meaning, bǎ (father), bá (pull out), bà (handle), bà (finish). 1.4 Simple syllable

Chinese syllable has the advantages of simple structure, clear boundaries, initials and finals have very strong regularity, which are very beneficial to Chinese learners to master the correct pronunciation.

II. PRINCIPLES OF CHINESE PHONETIC TEACHING

2.1 Targeted teaching principles

Almost all foreign language teachers have noticed that phonetic teaching must be targeted to develop different learning objectives according to different learners. To learn Chinese language learners are mostly adults, they have different pursuits, such as tourism, business, earn credits, out of love of Chinese culture and so on. If teacher use blindly high standards and strict requirements for different purposes’ students, it will be bound to make the students produce fear, and thus escape, even dislike.

For different teaching and learning difficulties, teacher must have a targeted training. For the same phonetic teaching content, due to the native phonetic negative migration and other factors, difficulty from different countries and even different learners will be different, in many countries, learning aspirated sounds, some students felt difficult. The specific situation is different in different conditions. There is no aspirated sound in some languages, although some languages exist aspirated sound, but belong to the same phoneme, does not distinguish meaning. Thus, some students will not pronounce aspirated sound, such as French, Italian, Farsi students. Some students can not distinguish aspirated and unaspirated sounds, such as English, Japanese students. As another example, at present language teaching profession generally considered that difficult order for foreign learners to learn Chinese tones is, Shang Sheng (third tone)-Qu Sheng (fourth tone)-Yin Ping (first tone)-Yang Ping (second tone). But Jiang Xiaohong pointed out the difficulty of Japanese students study tone sequence is: Qu Sheng (fourth tone)-Yin Ping (first tone)-Shang Sheng (third tone)-Qu Sheng (fourth tone). [2]

2.2 The combination of phoneme teaching and language teaching

For a long time, there are two different teaching methods in the teaching of basic Chinese language, that is, the so-called phoneme teaching and language teaching. [3] Phoneme stressed
the basic skills, from the individual training of initial ,finals and tones gradually to the vocabulary, sentence, conversation teaching. Language teaching emphasizes the study of phonetics in the stream of language. At the beginning, it begins with the sentence. Therefore, in the teaching of phonetics, to put practice into the single syllable phoneme teaching. Only reading a single sound, students can read each syllable of every word. On the other hand, people in communication have issued a series of a tone that will happen assimilation and dissimilation, weakening, shedding, sound and other changes. Therefore, good reading does not mean to say well. The best way is to combine the two, that is to teach the correct pronunciation of each tone, then integrating tone into speech stream, let the students experience the pronunciation changes, further correct sound in flow of speech tone.

In the early days of the phonetic teaching, that will have a period of time to focus on phonetics teaching, short time 15-20 hours, but students generally cannot completely grasp all the pronunciation at this stage, teachers need to constantly correct their pronunciation in the studying process. Many foreigners living in China for decades, but there are still problems concerned about pronunciation, therefore, pronunciation teaching is a long process.

2.3. the comparative analysis of key points and difficulties

Based on the Chinese and native language comparison, teacher can find phonetic difficulty, focusing on these difficulties that is the key to learning. There are two kinds of key points, one is the two approximate phonetic system, another is no same sound between Chinese and native language. In the communication, this pronunciation will not cause mis understanding or obstacles, Chinese are not corrected, so it is easy to make these errors solidify.

Usually the difficulty of teaching Chinese pronunciation is Chinese tone and tone change, aspirated and unaspirated sound, voiceless sound and voiced sound and several groups of difficult sounds, such as aspirated and aspirated difference, p,m,f; t,n, l,g,k, h, j,q, x,z,c,s, zhi, chi, shi, r, etc. The difference of li ngual sounds, apical consonant and blade-palatal j, q, x; z, c, s; zh, ch, etc. The difference of single finals, e, u, ü, etc. The difference between front and back nasal finals in the finals, a n, ang; en, eng; in, ing; ian, iang; uan, uang; uen, ueng and so on, these require teachers to have their own strong phonetic theoretical knowledge. There are some special difficulties for learners with different mother tongue background. For example, for English speakers, Chinese initials are very difficult, for Arabic speakers, Chinese finals are more difficult, so when teaching these pronunciation, teacher should predict errors in a dvance, and focus on training, timely summarize these sounds, to promptly correct the wrong pronunciation.

The phonetic teaching should be targeted to strengthen the training of the key and difficult, teacher cannot give up teaching due to students’ fear, because the initial pronunciation error will affect the final learning. For students of non-tonal language, the tone of the Chinese language is a whole new thing. They do not understand, the tone is one of the important features of Chinese pronunciation, playing the role to distinguish different meaning, transmitting a large amount of information, is an indispensable part of the Chinese syllable.

2.4 From easy to difficult, step by step

From easy to difficult is the principle of any study, in the Chinese pronunciation teaching, the traditional teaching order is: phoneme-syllable-word-sentence. However, we can adjust the arrangement of the teaching sequence by the difficulty of learning, we do not have to stick to the order of the Chinese phonetic alphabet, we can carry out teaching according to the order from easy to difficult. Such as ɑ、 o、 e、 i、 u、 0, you should first teach ɑ、 i、 u, then teach o, finally teach u, and then separately the unrounded sound ɑ、 e、 i from round sound ɑ、 u、 0. Unrounded sound also can be arranged according to the degree of opening size, according to i、 e、 a or ɑ、 e、 i to teach. Such as z、 c、 s, teacher should first teach s, this is a apical consonant, while z、 c are affricate, affricate is more difficult of course than an apical consonant.

2.5 Based on the understanding, the combination of mechanical training and meaningful training

Wei Mengyuan put forward that the phonetic teaching is different from other language teaching, it is not complete according memory, but repeated to listen, learn and imitate. Therefore, the pronunciation teaching should imitate, forming the new pronunciation habit. But the blind imitation will not only affect the efficiency of learning, and may not be able to detect some subtle sounds, and have the formation of the wrong pronunciation habits. Therefore, imitation should be built on the basis of imitation, only understanding the meaning, students can accurately and effectively grasp it. On the basis of understanding, imitation of pronunciation is not an easy thing, needing to imitate and imitate, repeat and repeat, sometimes mechanical training is essential, and foreign language teachers must have standard Mandarin, can give accurate demonstration, students can imitate to correct pronunciation. In order to arouse the learning enthusiasm of students, teacher reduce the dull feeling of fatigue. A more effective way is properly paid into meaningful training, some meaningful syllables, phrases, slang, idioms or short everyday language should be gave, it can arouse students' enthusiasm and avoid weariness.

III. PHONETIC TEACHING METHOD

At present, Cui Yonghua, Yang Jizhou put forward, phonetic teaching methods are mainly divided into three types, presentation, pronunciation guidance and pronunciation training skills.

3.1. Demonstration method

With the aid of diagrams, blackboard, somethings, gestures, posture and other means can demonstrate the pronunciation.

3.2. The picture display method

The picture of oral cavity (Fig 1) also can directly guide the pronunciation for some difficult sounds, such as to explain ng
(Fig 2). Five degree notation method for visual presentation of four tone(Fig 3):

![Fig 1 the picture of oral cavity](image1)

![Fig 2 ng of oral cavity](image2)

![Fig 3 Five degree notation](image3)

The designed writing on the blackboard has greater flexibility, it can be displayed according to the teaching situation, one by one, while teaching and writing, is a kind of dynamic display method, for example, the initials will turn to write on the blackboard, one by one after the initials and finals, finally in the intersection of the corresponding(Table 1), writing the syllable and starting spelling teaching. In phoneme teaching, table of finals and initials can be used to explain Chinese letters, the table also can explain phonological registration and writing rules, it can also get rid of the constraints of the fixed sequence chart at any time, to arrange the order of presentation content according to the needs of each syllable.

Table 1 intersection table of finals and initials

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3.3 the shape of mouth, gesture presentation

For some special sound, such as a single final u, students is not easy to master, but in English can not find the approximate pronunciation, teachers can take fixed way to practice, summarizing some characteristics of pronunciation and lip features, let the students correct the shape of mouth and pronunciation position so that they can make more precise pronunciation. When teaching u, teacher can allow students to review the pronunciation of i and u, in the teaching and pronunciation, teacher also have to pay attention to the fixed the shape of mouth and master difficulty, staying for a while, let the students look at the mouth, help the students feel pronunciation position. It can suggest that students use a mirror to watch their shape of mouth, and compare with the teachers, to achieve self correction.

3.4 Physical, posture demonstration method

The physical action is a good way to emphasize the articulation, such as for aspirated and unaspirated sound difference, you can put a little pieces of paper on the front of the mouth, let the students observe the vibration.

Teaching round sound, drawing a circle in front of the mouth with the hand and when teaching consonants, put your hand on your throat to feel vibration, while teaching tone, with your fingers gently swinging to express changes of tones.

3.5. Contrast method

Through the contrast between the two tone or two tone groups, then to master the pronunciation. The contrast of tones can be approximate sound and two different sound systems.

[b],[p],[d],[t] in English and b,p,d,t in Chinese have similar places, but there are still differences in articulation and aspirated methods, these are also easy to confuse, and even some Chinese students will transfer English pronunciation habits into Chinese pronunciation.

For some of the characteristics of Chinese pronunciation, teacher can have some pronunciation comparison training, gathering confusing syllables in the teaching, then doing meaningful reading training, and listening practice. z,c,s,zh,ch,sh,r and j, q,x,c,s are also difficult for foreign students, teacher can guide the students to associate, imitate the pronunciation according to the similar pronunciation in English.

3.6. Hyperbole

Hyperbole is a simple and easy teaching method, which is often used in the teaching of phonetics. General hyperbole is the start of the phonetic teaching and more effective, once students master the basic sound, in practice, especially in language teaching, the teacher must restore the natural pronunciation. Length of the pitch, the shape of mouth, contrast loudness is properly exaggerated, student's visual impression will have an expression deeply, to break through the difficulty of pronunciation.

3.7 Playing Games

Chinese is a relatively difficult language in the world, that increases degree of baldness in learning Chinese, so, how to use the limited classroom time and let learners get the maximum benefits? If there are some interesting games in the classroom, not only can deepen the learners' understanding and memory of the teaching content, but also can improve the dull atmosphere of the classroom, improving their learning interest.

IV. CONCLUSION

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Phonetic learning is the beginning stage of Chinese learning, which is directly related to the cultivation of students’ language ability. Foreign students, especially students from Europe and the United States generally think that Chinese is difficult to learn. Because they pay several time and energy learning Chinese than learning Indo-European languages. So if the phonetic teaching in the introduction stage achieved very good results, it is good to stimulate students’ interest in learning Chinese, so they will actively cooperate with the teaching, to achieve good learning results.

As a qualified foreign language teachers, in the stage of phonetics teaching, knowledge of Chinese speech is not enough, the teacher should also follow certain principles, grasp certain teaching methods, make students achieve a multiplier effect.

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Grievance Handling: Motivational tool for Employees

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Abstract- Grievance is very much present in every workplace especially in today’s era of globalization, if not tackled on time a minute grievance can become a conflict. A lack of interest has been found in the organisation to handle the grievance and also to use the grievance handling as a tool to motivate the employees. This empirical research discusses the various motivational theories and various grievance handling styles and at last the relationship between these two factors through the various cases. This empirical research study is based on the objective of finding the relationship between grievances of employees and their motivation. After considering various cases filed in Indian courts, it has been found that there is a relationship found between the grievances and motivation that every manager has to consider before the grievance turns into conflict. If the managers of the public or private organisations do not handle grievances at the initial stage, the consequences can be severe. To motivate the employees, grievance handling can be used as an effective motivational tool. Findings from this study will help manager motivate their employees by handling employees grievances at the earliest. The managers will learn to take care of even a minute grievance of employees.

Index Terms- Grievance, Motivation, Conflict, Negotiation

I. INTRODUCTION

Grievance is the dissatisfaction factor which an employee feels when working in a workplace. The grievances of the employees are related to the contract, work rule or regulation, policy or procedure, health and safety regulation, past practice, changing the cultural norms unilaterally, individual victimization, wage, bonus, etc. Grievance management is all about handling the grievance in more productive way. Conflict is the latent stage of grievance. Grievance, if not resolved on time, changes into conflict.

Motivation is basically motivating the employees to work in favour of their workplace to increase productivity of both employees and organisation. Effective grievance handling can be a motivational tool to boost the productivity of both, the employees and the workplace. Because increasing rate of grievance can decrease the motivation and productivity of employees, it affects the productivity of workplace directly.

II. LITERATURE REVIEW

2.1 Grievance

Grievance is a matter raised by employee to express dissatisfaction with management behavior and is an attempt to bring out changes (D’Cruz, 1999). Grievance involves an individual’s claiming that he or she has suffered or been wronged, often because of the actions or decisions made by the manager acting on behalf of the organisation (Anderson & Gunderson, 1982). A substantiated grievance is a signal that a manager’s behavior was in error or manager has breach worker’s right (Meyer, 1994). Often in organisations, the grievance arises because of lack of clarity in the explicit company’s rules (Hook, et. al, 1996). Noe, Hollenbeck, Gerhart & Wright, (2003) pointed out that too many grievances may indicate a problem but so may too few. According to them, a very low grievance rate may suggest a fear of filing a grievance, a belief that the grievance procedure is not effective or a belief that representation is not adequate.

According to Michael J. Jucius, “Grievance means any discontent or dissatisfaction, whether expressed or not and whether valid or not, arising out of anything connected with the company that an employee thinks, believes or even eels, is unfair, unjust, or inequitable.”

In an industrial enterprise, grievance may arise because of several factors such as:

- Violation of management’s responsibility such a poor working conditions,
- Violation of company’s rules and practices,
- Violation of collective bargaining agreement,
- Violation of labour laws,
- Violation of natural rules of justice such as unfair treatment in promotion, etc.

2.2 Motivation

Motivation is a driving force that propels people to action and continues them to action. It is the process of stimulating people to action to accomplish desired goals. It explains how and why the human behavior is caused. It is through motivation that managers attempt to inspire the employees to work for the organisation.

The term ‘motivation’ has been derived from the word ‘motive’ which means anything that initiates or sustains activity. It is an inner state that energies, activates or moves and that directs or channelize behavior towards goals. Motivation is a psychological force within an individual that sets him in motion for the achievement of certain goals or satisfaction of certain needs.

“Motivation is something that moves a person to action, and continues him in the course of action already initiated.”

“Motivation refers to the way in which urges, drives, desires, aspirations, or needs direct, control or explain the behavior of human beings.”

It refers to the way a person is enthused at work to intensify his desire and willingness to use his potentialities for the achievement of organisational objectives. The role of motivation...
is to develop and intensify the desire in every member of the organisation to work effectively and efficiently in his position.

2.3 Various Motivation Theories

2.3.1 Maslow’s Hierarchy of Needs (1940’s)

One of the first behavioural scientists to make management aware of the complexity of human needs and their effect on motivation was Abraham Maslow, a famous US psychologist. Abraham has classified needs in a logical conventional way that has important implications for managers. In this theory, he has pointed out and explained how needs influence human behaviour. Maslow viewed human motivation as a hierarchy of five needs ranging from most basic physiological needs to the highest needs for self – actualization.

1. **Physiological needs**: These are most basic needs including food, shelter and clothing. These needs are the most powerful motivators as individual can’t survive without them. Physiological needs must be satisfied to some extent or partially satisfied, before the individual moves to satisfy other higher category needs.

2. **Safety and Security Needs**: It includes the needs for protection against physical and psychological threats in the environment and confidence that physiological needs will be met in the future. Buying an insurance policy or seeking a secure job with a good pension plan are manifestations of security needs.

3. **Social Needs/Need for Affiliation**: It includes a feeling of belonging, of being accepted by others, of interacting socially and of receiving affection and support.

4. **Esteem Needs**: It includes self respect, achievement, competence, respect of others and recognition.

5. **Self actualization Needs**: It includes fulfillment of one’s potential and growth as a person. It is an open – ended need because it relates to the need to become more and more of what one is capable of becoming.

2.3.2 Herzberg’s Two Factor Theory

Herzberg, a US behavioural scientist, has proposed a theory of employee motivation based on satisfaction. Herzberg research has discovered two sets of factors associated with satisfaction and dissatisfaction of the employee, therefore, it is known as ‘Herzberg’s Two Factor Theory’.

The first set of factors known as ‘satisfiers or motivators’ are responsible for self motivation of employees. These factors include job, its importance, opportunity it provides for advancement, achievement, recognition and sense of responsibility, etc. These factors are known as ‘Job content factors’ and are real motivators because they are capable of providing satisfaction to the employee. These are known as ‘Intrinsic Factors’.

The second set of factors called ‘hygiene or maintenance or dissatisfier which include working conditions, job security, salary, quality of supervision, organisational policies, interpersonal relationships and other factors in the immediate work environment. They are job context and extrinsic to the job. Any deficiency or absence of these factors would simply create dissatisfaction, de-motivation and low performance but their presence does not motivate the employees. They have been considered as hygiene or maintenance factors because their role is supportive just to maintain healthy and congenial atmosphere in work setting.

2.3.3 Motivation Theory:

1. **McCelland’s Theory – Achievement**
2. **ERG Theory of Motivation – CLAYNTON ALDERFER**
3. **Equity Theory: J.S. ADAM**
4. **Vroom’s Valence– Expectancy Theory**
5. **Porter & Lawler’s Model/Modern Theory**
6. **McGREGOR’S Theory X and Y**
7. **Ouchi’s Theory Z**
8. **Reinforcement Theory**

2.4 Grievance handling methods and Motivation theories

Various methods of handling grievance were discovered from which two are prevailing: first is “Open-Door Method” and second is “Step-Ladder Procedure”. In open door method upper management is easily approachable in case of any grievance but in step ladder method upper management is not directly approachable. One has to go through the steps of ladder, i.e. has to follow the hierarchy to reach the higher authority.

Grievance many times confused with conflict or dispute. It is the grievance that turns into conflict if not handled sensitively and on time. Conflict is the spoken form of grievance. Rahim (1983), A famous researcher has defined styles of handling interpersonal conflict. Rahim (1983) has suggested five different styles in handling conflict including integrating, obliging, compromising, dominating and avoiding. Integration style concerns with collaboration between parties to reach an acceptable solution (Rahim & Magner, 1995). This style refers to the ability of manager to work with his or her employee to find a solution that fully satisfies the concerns of both. In integrating style, each party will learn and explore the grievance from his as well as other’s insight. The grievance resolution via this style will meet both parties’ objective. Obliging styles involves low concern for self. An obliging person attempts to emphasize commonalities to satisfy the concern of the other party (Rahim & Magner, 1995). To Thomas and Kilmann (1974) individual performing obliging style neglects his or her own concerns to satisfy the concerns of the other person. In this style, managers might take the form of selfless generosity or charity, obeying another person’s needs and prefer to yield another’s point of view. In compromising, this style involves moderate concern for self as well as the other party involved in conflict. It is associated with give-and-take whereby both parties give up something to make a mutually acceptable decision (Rahim & Magner, 1995). Compromising style also refers to splitting the difference, exchanging concessions or seeking a quick middle-ground position. Dominating style involves high concern for self and low concern for the other party involved in the conflict. It has been identified with a win-lose orientation or with forcing behavior to win position (Rahim & Magner, 1995).

The main point in studying the theories of grievances and conflict is to solve and handling the grievance at the initial stage and let it not be converted into a conflict. Because grievance can result in a big loss to the organisation it must be solved at the initial stage before it converts into dispute or conflict.

Like grievance handling procedures and conflict management styles, Motivation also has various theories, like:
Maslow’s Need Hierarchy, McClelland’s theory, Herzberg’s Two Factor theory, Vroom’s Valence- Expectancy theory etc.

III.  RESEARCH METHODOLOGY

The objective of this research is to investigate the relation between grievances of employee and their motivation. Method of research is non- empirical. Non-empirical research is used when secondary resources are used to collect the data. Various cases filed have been taken under consideration. These cases are related to employees grievances in which the employees are grieved because of many factors related to their jobs.

IV.  RESEARCH

There are certain cases regarding grievances of employees. The grievances were not handled on time and they became conflict. Many cases have been found in India regarding demotivation of employees because of non-handling of their grievances. Some are mentioned below:

1.  R. K. Sharma vs M/S Bharat Litho on 19th, 2009

Workmen filed two separate petitions before the Industrial Tribunal alleging that they were in service with the Management M/s Bharat Litho for the last four years as skilled workmen with last drawn wages of Rs.4500/- p.m. The management was not providing statutory benefits and when a demand for the same was raised, the Management got annoyed. The workmen joined union and raised a general demand dispute. In order to put an end to the general demand dispute, the management without serving any charge sheet, terminated their services. The complaint was made to the labour department through union but despite intervention by the labour inspector, they were not given duty. The demand notice was sent to which no reply was given by the management. The management did not pay retrenchment compensation and the termination of their services was challenged as illegal. The Management did not appear during conciliation proceedings due to which conciliation proceedings failed and since then the workmen were unemployed and could not get any services despite their best efforts, they claimed that they were entitled to reinstatement with continuity of service and full back wages.

2.  D.K. Khare vs The State Of Madhya Pradesh on 10 April, 2015

Petitioner was working as a daily wages Time Keeper and his case was considered for regularization. It seems that the Screening Committee which considered his case for regularization in accordance to the Circular dated 6.5.2007, found that his initial appointment in the department was not in accordance to the recruitment rules and is in violation of Article 14 and 16 of the Constitution, his claim for regularization was not recommended. As the petitioner continues as a daily wages employee, grievance of the petitioner is that he is entitled to pay in accordance to the recommendations of the 6 Pay Commission and as benefit has been granted to the person similarly situated, he is also entitled to the said benefit. Learned Writ Court has taken note of the aforesaid grievance of the petitioner and has found that petitioner's claim for regularization was rejected by the Screening Committee, therefore, petitioner continued to be in daily wages establishment, thus, the benefit claimed for was rejected.

3.  Mr. Sanmati Kumar Jain vs Ministry Of Mines on 18 February, 2013

A number of second appeals and complaints against the GSI were heard. In most of the cases it is noticed by the court that the CPIOs rarely send the desired information within stipulated period, in many cases, not the complete information. Similarly, it has been also noticed that the majority of the information seekers are either serving or retired employees of the GSI. This clearly shows that there is discontent among the employees about the manner of human resource management within the origination. The RTI is not a solution to human resource management problems; the authorities must be sensitive to employees grievances and make all efforts to address such grievance right at the time when these are first articulated. A careful scrutiny of all such RTI applications would also give an indication to the authorities about where the problem lies and how to resolve it.

4.  Mrs. Sunaina Singh vs Comptroller And Auditor General on 2 August, 2013

The employees of the Rajbhasha branch are being paid less than what their counterparts get in other similar establishments. All these and many more RTI requests seem to be originating because of this persistent grievance. This calls for the attention of the competent authority. The employee grievances should be addressed decisively so that some kind of closure is brought to the grievances. The CPIO is directed to place this order before the competent authority to look into the matter.

5.  Mr. Rammilan Sahu vs Ministry of Information on 29 July, 2013

The Appellant has several grievances against the functioning of the local stations of All India Radio. It is also noticed that he has sought information about the administrative and establishment matters relating to specific employees of the All India Radio, presumably, having very little relation to any public interest or activity. While every citizen has a right to seek all kinds of information from the government authorities, on the face of it, the kinds of information the Appellant has sought about the employees of the All India Radio clearly shows as if some disgruntled employees of the local station have used the good offices of the Appellant to secure information. The Appellant should be very careful in seeking such information. As far as the All India Radio is concerned, they should find out if there is anything wrong in the Shahdol station and make efforts to remove any employee grievance that might be at the root of such relentless information seeking. Very often, the RTI applications give a good idea about the condition of working in any particular office and the authorities should use the RTI as a measure to assess and evaluate the quality of functioning in that particular office.

These are only handful cases. In India only there are around 42 thousand cases related to employees grievances are registered. If handled on time, satisfaction never turns into grievance and grievance into conflict or dispute.
V. ANALYSIS

Grievance Handling as Motivational Tool

There are many factors that can be used to motivate the employees to achieve organisational goals. Like different factors of Maslow’s Need Hierarchy. One of the first behavioural scientists to make management aware of the complexity of human needs and their effect on motivation was Abraham Maslow, a famous US psychologist. Abraham has classified needs in a logical conventional way that has important implications for managers. In his theory, he has pointed out and explained how needs influence human behaviour. Maslow viewed human motivation as a hierarchy of five needs ranging from most basic physiological needs to the highest needs for self – actualization.

Various stages of Maslow’s Need Hierarchy include various factors. These all factors are directly related to grievance. For an example, if an employee is going through the need of third stage, i.e. Social Needs, and he found his social circle not acceptable then he is also facing grievance regarding his social life at the same time which affects his performance on the job to great extent. Like this different factors stated in different theories affects the performance of employees to some extent.

As a result of inquiry about the attitudes of employees, Herzberg (1959) developed two distinct lists of factors. One set of factors caused happy feelings or a good attitude within the worker, and these factors, on the whole, were task-related. The other grouping was primarily present when feelings of unhappiness or bad attitude were evident, and these factors, Herzberg claimed, were not directly related to the job itself, but to the conditions that surrounded doing that job.

Grievance can be related to any factor mentioned in the Herzberg’s theory. In the absence of any factor of hygiene grievance can be there. And it is necessary to understand and handle these grievances on time to motivate the employees. Employees directly feel motivated if their grievances handled on time i.e. a direct relationship has been found between grievance resolution and motivation. A grieved employee cannot work effectively in the organisation, and effectiveness is necessary for an organisation’s success. If grievance is not resolved on time it converts into conflict and can harm the organisation adversely.

There is a direct relationship found among the different factors of motivation and grievances related to them. If the grievance related to these factors or any other factor, which hinders the performance of the employees to any extent should be handled with care and solved as soon as possible. A grievance must be resolved before it turns into a dispute or conflict. However, a grievance is considered as a negative part in the organisations and never as a motivational tool. But if taken care of on time grievance handling can work as a motivational tool for the employees.

If Grievance would be handled and solved at earliest, it can be proven as a great tool of motivation. In today’s scenario of increasing mental work and decreased physical work, grievance handling can be used as a great motivation tool to all the organisations reviewing their motivational methods to increase the performance of their employees.

Positive relationship between increase in grievance handling and performance of employees is found at the workplace. If an employee has grievance regarding work methods, it can also be solved through training. Training and development has been proved a great method for resolving grievance of employees at workplace. Training and development helps the employees learn new methods and skills. Those skills and methods learnt in the training help employees to do their work efficiently and effectively. This efficiency helps the employees giving their best in their jobs and ultimately increasing organisational productivity.

Grievance mainly exists in the organisation because of dissatisfaction; dissatisfaction again arises because of non motivation of employees. An organisation should put efforts to keep its employee’s motivation and increase its employee’s morale. An organisation should follow various motivational theories to know its employees motivational level and then put efforts accordingly.

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Antibacterial Activity of some Macrophytes against Fish Pathogens

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Abstract- This paper embodies the antibacterial activity of aqueous extracts of three macrophytes Polygonium amphibium(leaves, rhizome), Potamageton pectinatus(leaves) and Ipomea aquatica(leaves, rhizome) against fish pathogen Pseudomonas aeruginosa isolated from freshwater fishes. During the study it was found that the strongest antibacterial activity among the above mentioned macrophyte species were obtained by the aqueous extract of Polygonium amphibium(leaves) with inhibition zone of 12.9mm followed by Polygonium amphibium(rhizome) with inhibition zone of 12mm. The aqueous extract of Ipomea aquatica(rhizome) marked 9.7mm inhibition zone followed by Potamageton pectinatus(leaves) with inhibition zone of 8mm while Ipomea aquatica(leaves) marked 7mm inhibition zone against Pseudomonas aeruginosa

I. INTRODUCTION

Fishes are cold blooded aquatic vertebrate animals which breathe by means of pharyngeal gills, propelling and balancing themselves by means of fins (Jhingaran, 1982). Fishes are a treasured resource in terms of food, sports and aquarium and for other scientific studies. The fish population of aquatic systems plays a significant role in the human economy (Talwar and Jhingaran, 1991). They offer job opportunities to millions of skilled and unskilled rural people, uplifting their economic levels in general and of the fisherman community in particular. Fish is the cheapest source of protein supply to rural community where potentialities for production exist (Forese and Pauly, 1998).

Fishes are susceptible to several bacterial infections (like Infectious dropsy, Furunclosis, Cotton mouth disease, Tail Rot or Fin Rot, Tuberculosus, Columnaris, Vibriosis), mainly when reared in high density conditions. Fishes living in tropical waters are more susceptible and prone to diseases than fishes living in temperate waters, because the former provides favourable conditions for introduction and spread of diseases (Hatha and Joice, 2005).

Plants are rich in a wide variety of secondary metabolites such as tannins, alkaloids and flavonoids which have been found in vitro to have antimicrobial properties. Compounds that inhibit pathogens but have little toxicity to host cells are candidates for developing new antimicrobial drugs (Agatemor, 2009).

II. MATERIAL AND METHODS

Macrophytes were collected from the Upper Lake (Bhopal, M.P.) Epiphytic and extraneous matter was removed by washing first by lake water and then with distilled water and transported to the laboratory in polyethylene bags at ice temperature. The fresh weight of these macrophytes was recorded. The macrophytes were identified by using special identification keys and by experts in the respective fields (Adoni, 1985) and identified as Polygonium amphibium, Potamageton pectinatus and Ipomea aquatica. The samples were shade dried for about 90 hours and weighed again. Then the individual parts of samples were separated from each other and their individual weight was also recorded. Also the rhizome was cut into pieces so that more of moisture will be released and it was dried properly. After that all the individual parts of these samples were separately powdered in a mixture grinder.

Plant material was extracted by using a Soxlet extractor with distilled water. Extraction of each part of plant powder (20 g) was done at room temperature in 150 ml of distilled water for about 8 to 10 hours.

The diseased fishes were brought from Shahpura Lake and Itwara Fish Market (Bhopal) and were ice preserved till carried to the laboratory and preserved in refrigerator. The diseased fishes were identified by common symptoms such as dizziness, red spots on the body and whitish patches on and near the gills etc. Nutrient agar media was prepared on five Petri plates. About 20 ml of nutrient agar was poured in each Petri plate and it was allowed to stand for few minutes to solidify.

The diseased fishes were scratched using sterilized needle at different body spots such as mouth, gills, tail and streaked in five agar plates which were put in an incubator for about 48 hours at 37°C. The growth of certain bacterial colonies where found in the form of slightly yellow coloured and white. The growth of some fungal colonies where also noticed. The new plates containing cultural agar media were prepared. The bacterial colonies that had grown on the previous plates were separated and enucleated aseptically on new plates to make cultural plates of pure bacterial colonies to avoid destruction by fungal colonies. The bacteria were identified by IMVIC test (Cappuccino and Sherman, 1995) which includes a series of four tests: Indole test, Methyl red test, Voges-proskauer test and Simmon’s citrate test. The antibacterial activity of distilled water extract was evaluated against one Gram-negative bacterium by paper disc method as described by Dulger (2005). The discs with macrophyte extracts were placed on nutrient agar plates. The plates were incubated overnight at 37°C. The diameters of the inhibition zones were measured in millimetres.

III. RESULTS

A 20g weight from each part of macrophyte were taken and extracted in 150ml of distilled water for about 8-10 hours. The total extract collected from extractor was found to be around...
100ml which was further heated to concentrate the extract solution and stored at 15°C.

Table 1: Showing fresh and dry weight of different macrophytes.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Macrophytes</th>
<th>Fresh weight (g)</th>
<th>Dry weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Polygonium amphibium (rhizome)</td>
<td>180</td>
<td>45</td>
</tr>
<tr>
<td>2</td>
<td>Polygonium amphibium (leaves)</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>Ipomea aquatica (rhizome)</td>
<td>150</td>
<td>35</td>
</tr>
<tr>
<td>4</td>
<td>Ipomea aquatica (leaves)</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>5</td>
<td>Potamageton pectinatus (leaves)</td>
<td>175</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 2: The weight of different parts of macrophytes, the distilled water used for extraction and the total extract received

<table>
<thead>
<tr>
<th>Plant name</th>
<th>Dry Weight</th>
<th>Distilled water used</th>
<th>Total extract received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polygonium amphibium (rhizome)</td>
<td>20g</td>
<td>150ml</td>
<td>100ml</td>
</tr>
<tr>
<td>Polygonium amphibium (leaves)</td>
<td>20g</td>
<td>150ml</td>
<td>100ml</td>
</tr>
<tr>
<td>Ipomea aquatica (rhizome)</td>
<td>20g</td>
<td>150ml</td>
<td>90ml</td>
</tr>
<tr>
<td>Ipomea aquatica (leaves)</td>
<td>20g</td>
<td>150ml</td>
<td>90ml</td>
</tr>
<tr>
<td>Potamageton pectinatus (leaves)</td>
<td>20g</td>
<td>150ml</td>
<td>100ml</td>
</tr>
</tbody>
</table>

The bacteria which were cultured on the agar plates were identified by IMVIC test as:

**Indole Test**: 5 ml portions of medium from a pure culture were inoculated and incubated at 35±0.5 °C for 24 hours. 0.2-0.3 ml of test reagent was added and it was gently shaken. The culture was allowed to stand for about 10 minutes and results were recorded. The absence of dark red colour in the amyl alcohol surface constituted a negative test.

**Methyl Red Test**: 10 ml portion of medium from a pure culture were inoculated and incubated at 35±0.5°C for five days. 5 drops of methyl red indicator were added to 5 ml of culture and it was again incubated for 48 hours. The absence of red colour constituted a negative test.

**Voges-Proskauer Test**: 5 ml portion of medium were incubated for 48 hours at 35±0.5°C. 0.6 ml of napthol solution and 0.2 ml of KOH solution were added to 1 ml of culture. The absence of colour change from pink to crimson at the surface within 5 minutes constituted a negative test.

**Simmon’s Citrate Test**: Agar medium was inoculated by the streaking technique using a light inoculums and it was incubated for 48 hours at 35±0.5°C. The colour change of medium from green to blue constituted a positive test.

The bacteria were identified as *Pseudomonas aeruginosa*. It is a rod shaped bacteria which is characterized by abundant thin, white growth with the medium turning slightly green. In IMVIC test, it shows its confirmation only when Citrate test is positive while with the remaining tests are found negative as shown in Table 3.

Table 3: showing identification of different bacteria by IMVIC Test.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Indole test</th>
<th>Methyl Red test</th>
<th>Voges-Proskauer test</th>
<th>Citrate test</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. coli</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Klebsiella pneumonia</td>
<td>±</td>
<td>±</td>
<td>±</td>
<td>+</td>
</tr>
<tr>
<td>Shigella dysenteriae</td>
<td>±</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Salmonella typhimurium</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>±</td>
</tr>
</tbody>
</table>
Psedumonas aeruginosa  –  –  –  +
Alcaligenes faecalis  –  –  –  ±
Styphylococcus aureus  –  –  –  ±
Streptococcus lactis  –  +  –  –
Micrococcus luteus  –  –  –  –
Corynebacterium xerosis  –  –  –  –
Bacillus cereus  –  –  ±  –

The extracts of different plant parts of macrophytes showed various inhibition zones. Among these plant distilled water extracts, *Polygonium amphibium* (leaves) showed the inhibition zone of 12.9 mm followed by *Polygonium amphibium* (rhizome) with inhibition zone of 12 mm which was followed by *Ipomea aquatica* (rhizome) and *Potamageton pectinatus* (leaves) with inhibition zones of 9.7 mm and 8 mm respectively while as, *Ipomea aquatica* (leaves) showed the inhibition zone of 7 mm.

<table>
<thead>
<tr>
<th>Table 4: Showing antibacterial activity of aqueous extracts against <em>Psedumonas aeruginosa</em>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. No.</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
</tbody>
</table>

IV. CONCLUSION

From the present study it can be concluded that there are several macrophytes that have the potential to treat several types of diseases without producing any side effects by inhibiting the growth (activity) of pathogenic microbes that are responsible for several fish fatal and other bacterial diseases. The leaves of *Polygonium amphibium* was found to have the maximum antibacterial activity against fish pathogens. So, the need of moment is to explore more number of plant species and natural products residing in such type of plants that could be potential sources for the reduction of bacterial diseases and others likely.

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Comparative Study of Some Heavy Metal Concentrations in Coconut Fluid and Milk Obtained From Taraba, Imo and Adamawa States, Nigeria


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Abstract- Coconut fluid and milk obtained from Takum, Taraba State, Owerri, Imo State and Jimeta, Adamawa State were analysed for the presence of the metals Fe, Pb, Cu, and Zn. The determination of their individual concentrations was done using AAS (model VGP 210 bulk scientific) and the results obtained were of the following trends; in coconut fluid, Fe>Zn>Cu>Pb, while in the coconut milk it follows this trend, Fe>>Zn>Cu>Pb. The overall results show that the metal levels were higher in the milk than in the fluid and for all the metals, the values obtained for Takum were generally low compared to those of Owerri and Jimeta.

Index Terms- Coconut, Fluid, Milk, Metals, Concentration.

I. INTRODUCTION

The coconut palm, Cocos nucifera is a member of the family Arecaceae (palm family). It is the only specie in the genus cocos and is a large palm growing to 30m tall with pinnate leave 4-6m long. It is generally classified into two general types, tall and dwarf. On fertile land, a tall coconut palm tree can yield upto 4-6m long. It is generally classified into two general types, tall and dwarf. On fertile land, a tall coconut palm tree can yield upto 75 fruits in a year (Hahn, 1997).

Botanically, the coconut fruit is a drupe not a true nut. Like other fruits it has three layers: exocarp, mesocarp, and endocarp. The exocarp and mesocarp make up the husk of the coconut. The mesocarp is composed of fibres called coir, it has many traditional and commercial uses. During the growth of the coconut palm, several mineral nutrients and metals are absorbed by the plant root as either major or trace elements. In this case the term coconut fluid is used for the liquid endosperm while the coconut milk is the white emulsion obtained by pressing grated coconut in hot water. The coconut Fluid (water) is considered the purest liquid second only to water itself. It is full of electrolytes, proteins, antioxidants, vitamins and minerals and provides an isotomic electrolyte balance (Paniappan, 2002).

Coconut water (fluid): serves as a suspension for the endosperm of the coconut during its nuclear phase of development later, the endosperm matures and deposit into the coconut rind during their cellular phase. It contains sugar, fibre, proteins, antioxidants, vitamins and minerals and provides an isotomic electrolyte balance (Paniappan, 2002).

Coconut milk: is obtained primarily by extracting juice by pressing the grated coconuts white kernel or by passing hot water or milk through grated coconut which extracts the oil and aromatic compounds. It has fat content around 17% when refrigerated and left to set coconut cream will rise to the top and separate from the milk.

This study is aimed at determining the levels of trace metals in the fluid and milk of coconut obtained in Takum from Taraba State, Jimeta market in Adamawa State and Owerri in Imo State using Atomic Absorption Spectrophotometry (AAS) and to compare the values with other standards.

II. MATERIALS AND METHODS

Sample Collection

Coconut fruits were collected from farms in Takum LGA, Taraba State by pulling it with the use of sticks, while the ones from Jimeta market, Adamawa State and Owerri, Imo State were purchased from the market. They were labeled A, B, C for each of the states. The husk of the coconut was peeled and removed from the husk followed by breaking the shell of the coconut and punching it with a sharp object in order to create a hole on the coconut which enables the water (fluid) to flow out. The flesh of the coconut is broken into pieces and crushed enabling the milk to be extracted for use in the analysis.

All weighings were done using the mettler balance and the glass wares were soaked in concentrated nitric acid followed by washing with detergent then several rinsing with distilled water before drying in an oven. Likewise all the reagents used were of analytical grades.

Extraction of the coconut Fluid and Milk

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The hard epicarp (shell) of the coconut seed was carefully cracked and the fluid (liquid endosperm) was collected in a clean beaker, filtered and measured. 100g of the soft endosperm (seed) was weighed and washed with distilled water. It was crushed and pounded to fine powder. The white emulsion obtained by washing the coconut seed is the milk. It was recovered by washing with several small portions of 200cm³ distilled water after series of pounding to ensure complete extraction. To reduce the oil content in the milk, it was filtered using what Mann filter paper. The filtrate is the coconut milk.

Preparation of the Aqueous Portion of the coconut Fluid and Milk

Based on the proportion of the reagent used in the preparation of the calibration curve, 80cm³ of the aliquot portion of the coconut milk was measured and placed in a 100cm³ volumetric flask. 4cm³ of conc. HNO₃ acid was added followed by the addition of 10cm³ of the 8% ammonium thiocyanate solution. The solution was diluted to the mark with distilled water and gently shaken to mix well. A red colouration was observed. Using similar procedure, blank solutions prepared with water and gently shaken to mix well. A faint colouration was brought from the eastern part of Nigeria. Of interest is the high level of iron (12.260ppm) in the milk of coconut from Owerri compared to that obtained in the fluid (2.080ppm).

The variation in the metal levels may be due to regional factor due to variation of the soil pH, the extent of deposition of used metal scraps and similar objects which may be more in the eastern part of Nigeria because of its industrialization compared to Takum, Taraba State which is in northeastern Nigeria which is far less industrialized.

IV. CONCLUSION

Both coconut fluid and milk contain Fe, Cu, Zn and Pb though they vary from one location to another but the concentration levels are moderate and essential for human consumption. Among the samples analysed the coconut obtained from B (Jimeta market) might have been brought from the eastern part of Nigeria. Of interest is the high level of Fe (2.080ppm) compared to that obtained in the fluid (1.7767ppm).

The results obtained from the analysis of coconut fluid and milk from Takum, Jimeta, and Owerri are as shown in Table 1 below

<table>
<thead>
<tr>
<th>Sample Location</th>
<th>Iron (Fe) ppm</th>
<th>Lead (Pb) ppm</th>
<th>Copper (Cu) ppm</th>
<th>Zinc (Zn) ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Takum (A) Fluid</td>
<td>0.280</td>
<td>0.076</td>
<td>0.300</td>
<td>1.040</td>
</tr>
<tr>
<td>Milk</td>
<td>0.700</td>
<td>0.138</td>
<td>1.280</td>
<td>0.850</td>
</tr>
<tr>
<td>Jimeta (B) Fluid</td>
<td>2.970</td>
<td>0.084</td>
<td>0.760</td>
<td>1.780</td>
</tr>
<tr>
<td>Milk</td>
<td>1.100</td>
<td>0.132</td>
<td>1.960</td>
<td>1.600</td>
</tr>
<tr>
<td>Owerri (C) Fluid</td>
<td>2.080</td>
<td>0.061</td>
<td>0.900</td>
<td>0.350</td>
</tr>
<tr>
<td>Milk</td>
<td>12.260</td>
<td>0.300</td>
<td>2.060</td>
<td>3.760</td>
</tr>
<tr>
<td>Mean of ABC Fluid</td>
<td>1.7767</td>
<td>0.3017</td>
<td>0.6533</td>
<td>1.390</td>
</tr>
<tr>
<td>Milk</td>
<td>4.6867</td>
<td>0.1967</td>
<td>1.7667</td>
<td>2.070</td>
</tr>
</tbody>
</table>

From the results in Table 1, the metal levels in the coconut fluid (water) were low compared to those of coconut milk and generally in the fluid the concentration of Iron (1.7767ppm) is highest, followed by Zinc (1.390ppm) while lead (0.3017ppm) was the least. The concentrations follows the following trends; Fe>Zn>Cu>Pb. While the pattern in the coconut milk was similar to that of the fluid though the concentration of the metal levels were generally high compared to those in the fluid and the trends in the milk follows this pattern Fe>>Zn>Cu>Pb.

If the metal level concentrations were considered based on location, that of locations B and C are on the higher level compared to those of A. This may be attributed to the fact that coconut obtained from B (Jimeta market) might have been brought from the eastern part of Nigeria. Of interest is the high level of iron (12.260ppm) in the milk of coconut from Owerri compared to that obtained in the fluid (2.080ppm).

The variation in the metal levels may be due to regional factor due to variation of the soil pH, the extent of deposition of used metal scraps and similar objects which may be more in the eastern part of Nigeria because of its industrialization compared to Takum, Taraba State which is in northeastern Nigeria which is far less industrialized.

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Phytochemical screening and proximate nutritional analysis of brown leaves of Indian almond (Terminalia catappa L.)

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Abstract- The phytochemical and proximate nutritional analyses of brown leaves of Terminalia catappa L. were determined using the methods of Association of Official Analytical Chemists and expressed in mean standard deviation. The phytochemical concentrations (mg/100g) of the aqueous, ethanoloamethanol extract revealed the presence of tannins (0.50±0.58, 0.49±0.58, 0.47±0.56), saponins (2.67±1.33, 2.99±1.41, 3.31±1.49), alkaloids (1.20±0.89, 1.32±0.89, 1.23±0.90), phenols (0.32±0.49, 0.45±0.55, 0.35±0.48), flavonoids (0.93±0.79, 0.86±0.76, 0.65±0.66), anthraquinones (0.02±0.05, 0.03±0.06, 0.04±0.05) and glycosides (-, 0.62±2.02, 2.10±1.18) respectively. The result revealed that the leaves were very high in glycosides, saponins and alkaloids but low in tannins, phenols, flavonoids and anthraquinones. The proximate nutritional analysis revealed crude protein 4.2±1.67, fibre content 12.9±2.94, fat content 4.6±1.75, ash content 12.1±2.84, moisture content 8.3±2.35, and carbohydrate content 57.9±6.21. Carbohydrates had the highest concentration followed by fibre, ash and moisture content, while proteins and fats had low concentration. This study justifies the use of Terminalia catappa L. leaves by traditional practitioners to treat various ailments and by pharmaceutical companies to produce useful drugs. The leaves are rich source of carbohydrates, fats and proteins.

Index Terms- Terminalia catappa, phytochemical analysis, nutritional analysis, brown leaves

I. INTRODUCTION

The therapeutic and medicinal properties of plants have been in existence for thousands of years. However the use of plants to cure diseases and relieve physical suffering dates back to the ancient times of man’s history. The use of plants as medicine by traditional people laid basis for the evolution of modern medicine. Herbal therapy has come of age and today medicinal plants play a significant role in human health care globally. Plant natural product chemistry has played an active role in generating significant candidate compounds in drug discovery programs. Nutrition is the science of food, the nutrients and other substances there in, their action, interaction and balance as related to health and diseases. Nutrients are grouped into six (6) classes namely carbohydrates, fats (lipids), proteins, vitamins, mineral and water. The general functions of these nutrients include fuel (energy) expressed in kilocalories, building materials for body structures, regulation and control of body processes.

Terminalia catappa L. was used by locals to treat a wide range of ailments (malaria, pains, headache, sickle cell disease, cough, asthma, sexual dysfunction and rheumatic joints) and also food for farm animals. So, this study becomes pertinent as to reveal and evaluate the phytochemicals present in the brown leaves of Terminalia and show how rich in nutrients this plant is. This research will serve as an avenue for developing new drugs as a result of phytochemicals present in them and also as a source of food for animals. In this work we determine the qualitative and quantitative phytochemical content of brown leaves of Terminalia catappa using ethanol and methanol and aqueous extracts. The paper is organized as follows: Section 1 has the introduction, the Materials and method are discussed section 2. In section 3, we presents our findings. Finally, we give a brief discussion in section 4 before the conclusion in section 5 and then the references also given.

Experimental Sample Collection

The brown leaves of Terminalia catappa were collected from University of Calabar, Calabar.

Preparation of Plant Material

Fully matured brown leaves of Terminalia catappa were collected and washed with running tap water followed by sterile distilled water. Plant sample was air dried at room temperature in a clean environment to avoid contamination and then ground into powder using domestic grinder. Powdered sample was stored in air tight glass bottle at room temperature for use.

Preparation of Plant Extract

50g of sample (powdered brown leaves of Terminalia catappa) was measured into a thimble. A water condenser was attached to the Soxhlet extractor, connected to the neck of a 500ml flask containing the solvent, 300ml of water held over the hot plate. Vapour produced from the heating solvent reaches Soxhlet extractor through the side tubers and condensed by passing through the condenser. The solvent now condensed and dropped on the powdered sample in the thimble, dissolving the required substance; the solution was filtered through the downward tubes into the flasks holding the solvent. This process continued until the solvent passing through the thimble became colourless. At this point the extraction was complete. The extract was distilled off and evaporated to obtain solid sample for the phytochemical test (AOAC, 2000).
Phytochemical Screening

Standard procedures were employed to test for the presence of phytochemicals such as tannins, saponins, alkaloids, glycosides, phenols, flavonoids and anthraquinones in the brown leaves of *Terminaliacatappa* (Trease and Evans, 1989).

Proximate Analysis

The proximate analysis of powdered plant material of brown leaves of *Terminaliacatappa* was carried out using the AOAC (Association of Official Analytical Chemist, 1995, 2000) methods in the Department of Chemical Sciences, Cross River State University of Technology (CRUTECH). The sample was analyzed for moisture, crude protein, crude fat, ash content, fibre content and carbohydrate.

II. RESULT

Qualitative Analysis of *Terminaliacatappa L.* using AOAC

The result of the qualitative analysis of *Terminaliacatappa L.* in Table 1 revealed the presence of alkaloids, saponins, tannins, phenols, flavonoids, glycosides and anthraquinones in different concentrations.

<table>
<thead>
<tr>
<th>Chemical Constituent</th>
<th>Aqueous Extract</th>
<th>Ethanol Extract</th>
<th>Methanol Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tannins</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>2 Saponins</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>3 Alkaloids</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>4 Glycosides</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>5 Phenols</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6 Flavonoids</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>7 Anthraquinones</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Keys

(+ ) = Present; (++) = moderately present; (+++) = highly present; ++++ = excessively present; (- ) = absent

Quantitative analysis of *Terminaliacatappa L.* using AOAC

The result from the quantitative analysis of green leaves of *Terminaliacatappa* in Table 2 revealed the presence of alkaloids, saponins, tannins, phenols, flavonoids, glycosides and anthraquinones in different concentrations as calculated using mean and standard deviation.

<table>
<thead>
<tr>
<th>Chemical Constituent</th>
<th>Aqueous Extract</th>
<th>Ethanol Extract</th>
<th>Methanol Extract</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tannins</td>
<td>0.50±0.58</td>
<td>0.49±0.57</td>
<td>0.47±0.56</td>
</tr>
<tr>
<td>2 Saponins</td>
<td>2.67±1.33</td>
<td>2.99±1.41</td>
<td>3.31±1.49</td>
</tr>
<tr>
<td>3 Alkaloids</td>
<td>1.20±0.89</td>
<td>1.32±0.89</td>
<td>1.23±0.90</td>
</tr>
<tr>
<td>4 Glycosides</td>
<td>-</td>
<td>6.12±2.02</td>
<td>2.10±1.18</td>
</tr>
<tr>
<td>5 Phenols</td>
<td>0.32±0.46</td>
<td>0.45±0.55</td>
<td>0.35±0.48</td>
</tr>
<tr>
<td>6 Flavonoids</td>
<td>0.93±0.79</td>
<td>0.86±0.76</td>
<td>0.65±0.66</td>
</tr>
<tr>
<td>7 Anthraquinones</td>
<td>0.02±0.05</td>
<td>0.03±0.06</td>
<td>0.04±0.06</td>
</tr>
</tbody>
</table>

1.1. Proximate analysis of green leaves of *Terminaliacatappa L.*

The result from the proximate analysis of the green leaves of *T. catappa* in Table 3 revealed that the leaves contained moisture, ash, crude fat, crude fibre, crude protein and carbohydrate in their different concentrations as calculated using mean and standard deviation.
Table 3: Shows the proximate composition of brown leaves of *Terminalia catappa*.

<table>
<thead>
<tr>
<th>S / Number</th>
<th>Nutrient Composition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Proteins 4.2 ± 1.67</td>
</tr>
<tr>
<td>2</td>
<td>Fibre 12.9 ± 2.94</td>
</tr>
<tr>
<td>3</td>
<td>Fat 4.6 ± 1.75</td>
</tr>
<tr>
<td>4</td>
<td>Ash 12.1 ± 2.84</td>
</tr>
<tr>
<td>5</td>
<td>Moisture 8.3 ± 2.35</td>
</tr>
<tr>
<td>6</td>
<td>Carbohydrate 5.7 ± 6.21</td>
</tr>
</tbody>
</table>

III. DISCUSSION

In this study, the findings on the phytochemical screening of aqueous, ethanolic, methanolic extracts, and proximate nutritional analysis of plant sample revealed the presences of tannins, saponins, alkaloids, glycosides, phenols, flavonoids, and anthraquinones as shown in Table 1. Saponins (2.67±1.33, 2.99±1.41, 3.31±1.49) and alkaloids (1.20±0.89, 1.32±0.89, and 1.23±0.90) were highly present in aqueous, ethanolic, and methanolic extrac respectively. Glycosides were highly present in ethanolic (6.12±2.02) and methanolic (2.10±1.18) extracts but absent in aqueous extract of sample while tannins (0.50±0.58, 0.47±0.56), phenols (0.32±0.49, 0.45±0.55, 0.35±0.48), flavonoids (0.93±0.79, 0.86±0.76, 0.65±0.66) and anthraquinones (0.02±0.05, 0.03±0.06, 0.04±0.06) were found in low quantity as shown in Table 2. The phytochemical screening of brown leaves of *Terminalia catappa* agree with the findings of other researchers. (Yakubu et al., 2005), reported that the presence of saponins, phenols and glycosides may be responsible for the acclaimed anti-anemic potential of plants used in traditional medicine. Singh et al., (1991) explained that the saponins are known to enhance natural resistance and recuperate body power. (Babayi, et al., 2004) reported that the occurrence of tannins shows that the plant may be useful in food and pharmaceutical industries.

The proximate analysis of brown leaves of *Terminalia catappa* reveals the presence of nutrients namely: protein 4.2±1.67, Fibre 12.9±2.94, fat 4.6±1.75, Ash 12.1±2.84, moisture 8.3±2.35, with high carbohydrate 57.9±6.21. This values above shows that the brown leaves of *Terminalia catappa* will make a good food for farm animals as it is rich in carbohydrate. This study is similar to the work done by (Vijaya et al., 2012)on the evaluation of proximate composition and phytochemical analysis of *Terminalia catappa* from Naga pattinam region of India.

IV. CONCLUSION

The brown leaves of *Terminalia catappa* contain phytochemicals (saponins, tannins, alkaloids, flavonoids, phenols, glycosides and anthraquinones) that are potential sources for useful drugs. This study may be considered for further feeding and testing in experimenting animals for disease conditionsto justify the use of leaves of *Terminalia catappa*L. for treating various ailments by traditional practitioners. The awareness created by this study can be used for further development of phytomedicines and remedies that can improve health status of humans.

REFERENCES


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Evaluation of variability of weeds in rice fields of Gharghoda blocks of Raigarh district, Chhattisgarh

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Abstract- The most common problems encountered in the Indian farmers throughout in agriculture is control of obnoxious, undesirable, unwanted, useless, ugly and often persistent plants, injurious for crops interfere with agricultural operations increases labour and cost of production and finally reduce the crop yields. Such plants are known as weeds. Although there are losses caused by the weeds within field in terms of crop yield, crop weeds competition for space, water, light and nutrients, increases in cost of agriculture production, reduction in price of farm produce, effects livestock product quality, reduction in land value, harbors to pests and diseases, bad effect on human health and soil productivity. However, some weeds have also beneficial effect in agriculture as well as human life. They are, weeds check erosion of the soil, very good medicinal value, green manure, forages, contributions of plant nutrients, industrial importance i.e. aromatic oil/thatches/agarbatti/scent/antibiotic, improvement of saline soil, crop hybridization, beautification, environmental purification, nitrogen fixation, mulching, vegetables, fencing etc. Different fields were selected randomly under three categories viz. direct seeded fields, transplanted fields and fallow land in Gharghoda block of Raigarh district of Chattisgarh. A square quadrant of 1m x 1m of iron frame will be used for sampling. Quadrants were laid randomly in the field. Randomization was done approximately. For randomization each field were divided into, approximately 10 x 10m square areas. The squares were numbered and thus with the help of random number tables area for laying the quadrant was selected. Within the 10 x 10 m sq area one quadrant was sampled. In this way 4 quadrats were sampled in each of the fields. Number of weed, species wise, was recorded and three plants were uprooted for photography and the preparation of dry herbarium. Climatic data was collected from nearest meteorological for temperature, rainfall and relative humidity. The Frequency, density, abundance and their relative values and Importance value index (IVI) of individual specie were calculated. Soil samples were collected from each of the areas and were analyzed for different physio-chemical parameters. Since the economic condition of Chhattisgarh also depends on agriculture and number of crops are grown by the farmers. Out of them, paddy is a major crop cultivated in monsoon and summer season depending up on irrigation facility. The average productivity of paddy is less (21.0 q/ha.) due to many factors and weed infestation especially early stage of crop growth is one of them. Damage caused by weeds in rice productivity ranges 15 to 85 percent depending on cultivation methods, soil and weed types, rainfall and management. Chhattisgarh farmers are not much aware on these aspects. Weed is a serious problem for state agriculture. Hence, survey, collection, identification, classification and preservation of weed are essential for effective control considering the above facts, the present investigation is therefore proposed.

Index Terms- Weeds, survey, variability, paddy, rice field, Gharghoda block, Raigarh district of Chattisgarh.

I. INTRODUCTION

Weed is remarkably adapted to a changed environment to such an extent as to be a threat to other plants. Whether a plant is considered a weed depends not only on its characteristics and habit but also on its relative position with reference to crop plants. Thus a plant of economic crop may also become a weed if it is found growing with other crops where it is not wanted. But for practical purpose weeds are undesirable, injurious, unsightly and troublesome plants which interfere with cultivated crops and affect human affairs [1]. Weeds comprise all types of plants, grasses, sedges, rushes, aquatic plants and parasitic flowering plants. Some weeds are useful as animal fodder. Indeed, weeds, as a class, have much in common with criminals. When not engaged in the nefarious activities both may have admirable qualities a thief may be an affectionate husband and father outside business hours. An aggressive weed in one environment may be charming with flowers in another modern scientific psychology has done much to illuminate the criminal mentality and a thorough knowledge of the biology of the species concerned, is equally important in the understanding of the behavior and control weeds.

No plant is useless in nature. However, in the present study, it has been restricted to weeds infesting the crop fields of the district. As the crop fields cover the largest portion of the rural areas, so the roles played by the rural women only are taken into account. Crop field weeds, regarded undesired and neglected as the constant source of annoyance and trouble to the farmers are simply eradicated by plucking and throwing away; but in fact, they are important form the standpoint of medicinal, allelopathic and food values [2]. Some researchers have also reported medicinal industrial and allopathic uses of several obnoxious weeds [3]. Weed problem is major one in Raigarh district. According to the farmers of Raigarh district the losses in crop yields have been estimated at 10-20 percent in wheat, 15-20 percent in rice and 20-30 percent in vegetables. Therefore, the farmers are advised to restrict the weed growth at early seedling stage. Agriculture is a back bone of Indian economy most of the farmers are busy with field plantation during Rabi and Kharif
seasons. They try to avoid the growth of the weeds by sowing certified seeds [4-5]. The irrigation systems give maximum growth of the weeds. To control weed growth a very wide range of herbicides are available. Therefore, the farmers are to be trained to select the most appropriate one for weed control problem. Thus, the present study was subjected to study the variability and diverse nature of weeds in Gharghoda block associated with different fields of Raigarh district of Chattisgarh.

II. MATERIALS AND METHODS

The following strategies were adopted to fulfill the objectives of the work:

2. Survey of weeds in lowland and transplanted rice fields Gharghoda block.

In general percentage of area under direct seeding (Sowing) is more than the area under transplantation, while area under fallow land is lowest hence following no of fields was selected randomly under three categories in each of the blocks viz : Gharghoda blocks of Raigarh district of Chhattisgarh:

1. Direct seeded fields – 10 in each block = 24
2. Transplanted fields – 6 in each block = 12
3. Fallow land – 2 in each block = 4
Total = 40

4. Sampling

A square quadrant of 1m x 1m of iron frame was used for sampling. Quadrants were laid randomly in the field. Randomization was done approximately. For randomization each field was divided into, approximately 10 x 10m sq areas. The squares was numbered and thus with the help of random number tables area for laying the quadrant was selected. Within the 10 x 10 m sq area one quadrant was sampled. In this way 4 quadrants was sampled in each of the fields. Number of weed, species wise, was recorded and three plants was uprooted for photography and the preparation of dry herbarium [6].

5. Climatic data for the study area:

This was collected from the nearest meteorological for temperature, rainfall and relative humidity.

6. Phyto-sociology of weeds

Frequency, density, abundance and their relative values and Importance value index (IVI) of individual specie was calculated using the following formulae [7]

\[ \text{IVI of weeds} = \text{Relative frequency} + \text{Relative density} + \text{Relative abundance} \]

<table>
<thead>
<tr>
<th>Description</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative frequency</td>
<td>[ \frac{\text{No. of sampling plots in which the species is present}}{\text{No. of individuals of the species}} \times 100 ]</td>
</tr>
<tr>
<td>Relative density</td>
<td>[ \frac{\text{Density of the species}}{\text{Relative frequency}} \times 100 ]</td>
</tr>
<tr>
<td>Relative abundance</td>
<td>[ \frac{\text{Abundance of the species}}{\text{Relative frequency} + \text{Relative density} + \text{Relative abundance}} \times 100 ]</td>
</tr>
<tr>
<td>Abundance</td>
<td>[ \text{No. of individuals of the species} ]</td>
</tr>
<tr>
<td>Frequency</td>
<td>[ \frac{\text{No. of sampling plots in which the species is present}}{\text{No. of individuals of the species}} \times 100 ]</td>
</tr>
<tr>
<td>Density (Ha⁻¹)</td>
<td>[ \frac{\text{No. of individuals of the species}}{\text{Total area sampled (ha)}} ]</td>
</tr>
<tr>
<td>Total area sampled (ha)</td>
<td>[ \text{Total} = 40 ]</td>
</tr>
</tbody>
</table>

7. Shanon index of diversity (H′):

For the calculation of Shanon index IVI values of the species was made by.

\[ H' = -\sum p_i \log p_i \]

Where:

- \( H' \) = The Shanon Diversity Index
- \( p_i \) = The relative abundance of the species

*(Or) can also be calculated as-

\[ H' = -\sum (Ni/N) \times \log (Ni/N) \]

Ni = Importance value of a species
N = Importance value of all the species

Simpson index of diversity was calculated using the formula:

Simpson index of diversity (D) = \( p_i^2 \)

Where:

- \( p_i \) = IVI of the species

8. K-dominance and rarefaction plot for weeds:

K-dominance and K-dominance and rarefaction plot for weeds will be plotted with the help of computer based software.

9. Photographic herbarium and dry herbarium of weeds:

a) Photographic herbarium

Photographs of the weeds were taken in their natural habitat as well as by spreading the collected weed plant at some suitable place to get a good photograph of the species.

b) Dry Herbarium

Dry herbarium was prepared as follows:

Collection of weed as far as possible in flowering and fruiting condition

i) Place the plant tween sheets of blotting paper/news paper
ii) Press the plant in a herbarium press
iii) Change the blotting paper/news paper frequently till complete dryness of the plant
iv) Paste the plant on a herbarium sheet
v) Spray the plant with 1% solution of HgCl₂
vi) Label the plant
vii) Store the herbarium sheet at a dry place

10. Economic importance of weeds:
Information on the economic Importance of the weeds was gathered from the published literature and personal interview from the local people. Medicinal property of the plant was determined through questionnaire. The questionnaire was filled from local healers and knowledgeable persons from the villages.

11. Soil analysis:
Soil samples were taken from the selected area for analysis. Sample from 0-5 and 15-20 cm depth was collected by “Soil auger” after clearing the surface. Such samples were taken from 3 places from each field of vegetation. Composite samples were prepared depth wise for each field. Sample was labeled properly for date, place and depth of collection. Soil samples were dried in air at room temperature. While drying, each of the sample was covered with paper to prevent falling dust or dirt on it. After proper and sufficient drying each composite soil sample was stored in clean polythene bags. Soil analysis was done as per standard methods [8].
(a) Colour
(b) pH - The analysis of pH (1:2.5 soil : water) was done by Glass electrode pH meter.
(c) Available N - The analysis of available N (kg ha⁻¹) was done by Alkaline permanganate method [8].
(d) Available P - The analysis of available P (kg ha⁻¹) was done by Olsen method.
(e) Available K - The analysis of available K (kg ha⁻¹) was done by Flame photometer method.
(f) Electrical conductivity (E.C.) - The analysis of Electrical conductivity (dSm⁻¹ at 25°C) was done by Solubridge method.

III. RESULTS
Environmental pollution has imposed serious threat globally mainly due to the growing utilization of agrochemicals including pesticides. With global perspective of environmental protection and food security, indigenous wisdom is getting worldwide importance for sustainable eco-friendly agriculture production system. To combat the challenges of today’s food production, healthcare and nutritional security, biological pesticides including plant-based pesticides can play a greater role. Insect pests, diseases and weeds inflict enormous loss to the potential agriculture production. Anecdotal evidences also indicate rise in the loss, despite increasing use of chemical pesticides. At the same time, there is a rising public concerns about the potential adverse effects of chemical pesticides on the human health, environment and bio-diversity. These negative externalities, though, cannot be eliminated altogether but their intensity can be minimized through development, dissemination and promotion of alternative technologies such as plant-based pesticides. India has vast flora and fauna that have potential for developing in to commercial technologies. The results are shown in Tables 1 - 4 and Figure 1.

IV. DISCUSSION AND CONCLUSION
Raigarh is the important district of Chhattisgarh. The soil of entire district is less fertile on account of low percentage of organic matter. The irrigation facility is negligible because the net work of Sardar Sarovar Project is not completed. Only few villages are irrigated by tube wells, tanks and wells. On account of poor fertile soils, less organic materials of the soil, low irrigation potential, some of the areas are converted into industrial zones. The chemical industries are well developed in these zones, which cause air and water pollution the also effect on soil composition. As a result the growth of weeds is seen in every crop, weeds are intermixed with cereals, legumes. Fibre, sugarcane, vegetables and fodder crops. Therefore the climatic, edaphic and biotic factors are constantly acted upon all the crops at every stage and they try to reduce the farm yield. Environmental factors such as low and high temperatures, wind velocity and rainfall are playing major role on agriculture practices. The annual rain fall is reduced constantly. Therefore, weed crop competition for moisture usually occurs along with other elements of competition. It becomes increasingly critical with increasing soil moisture stress as occurring in the dry farming areas of semi arid and arid regions of Raigarh district. Therefore, in dry land agriculture the actual evaporation from the weedy crop fields is much more than the evaporation from a weed free crop field weeds remove the soil moisture hence the yield in non irrigated fields is very less than the irrigated fields. Weed competition for moisture, nutrients are plentiful and weeds have an edge over crop plants. Crop likes Cotton, Maize, vegetables and sugarcane are prone to heavy weed growths at their seedling stage and consequently suffer badly at the fruiting stage. Animals both- domestic and wild as well as human activities are the key biotic factors. Rapid industrialization and urbanization of Raigarh district have direct impact on agriculture practice. Short supply of field workers is directly affected on weed control. Most of the farmers, erroneously assume that removing weeds any time during the growing season was good enough for obtaining full benefits of weeding in terms of increased crop-yield but contrary to it sub substantial scientific evidences are available that time of weeding a crop is as important as the weeding itself. The weeds that germinate either before or along the crop offer stronger competition to it then the later germinating ones. It has been observed that these early weeds accumulate dry matter faster than the crop seeding. In Maize, Sorghum and Bajara weeding is done 1/3 or 1/4 growing periods of crops which gives optimum yield. The hottest month during the last eight years is April. The average minimum temperature is 10.43°C and average maximum temperature is 42.76°C during last eight years. The mean of the maximum temperature of the month of May in last eight years is 44° C and the mean of minimum temperature is 21° C. The coldest month during the last eight years is February. The average temperature of the month February during last eight years is 10.94°C. The mean of the maximum temperature of the month of February in last eight years is 38° C and the mean of the minimum temperature is 10° C.

The rainfall during monsoon is highly erratic, both in intensity and intervals between two successive rains. The average total rainfall in last eight years is 850 mm. The maximum rainfall recorded was 1015.8 mm in year 2001 and lowest rainfall...
recorded was 663.1 mm in 2005. The average rainy days during the 2000-2007 is 44 days. The average of maximum relative humidity of the month of November 89.90 % and the average of minimum relative humidity of the month of November is 87.90 %. Other months which shows high average of relative humidity is September (88.58 %), October (88.51%), December (88.41%), April (82.18%). Weed competition is most severe when the competing weeds are having similar vegetative habits and demand upon available resources. Weed competition depends upon the type of weeds, duration of weeds, soil moisture, climatic condition and severity of infection [9-12].

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Table 1: Weeds species in Gharghoda ropa field

| S.No | NAME OF PLANT SPECIES     | C   | D   | E   | F   | G   | H   | I   | J   | K   | L   | M   |
|------|---------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1    | Cynodon Dactylon          | 13  | 10  | 2   | 2   | 1   | 6   | 1   | 2   | 0   | 2   | 1   | 9   | 102  | 10  | 9   | 90  | 10.2 | 11.33 | 18.75 | 20.6 | 11.12 | 50.47 |
| 2    | Merremia Emarginata       | 0   | 0   | 2   | 0   | 1   | 3   | 0   | 6   | 0   | 0   | 0   | 0   | 21   | 10  | 3   | 30  | 2.1  | 7     | 6.25  | 4.24 | 6.87  | 17.36 |
| 3    | Melochia Corchorifolia    | 0   | 0   | 0   | 0   | 2   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 2    | 10  | 1   | 10  | 0.2  | 2     | 2.08  | 0.4  | 1.96  | 4.44 |
| 4    | Medicagn Polymorpha       | 0   | 0   | 9   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 9    | 10  | 1   | 10  | 0.9  | 9     | 2.08  | 1.81 | 8.83  | 12.72 |
| 5    | Amaranthus Viridis        | 0   | 0   | 0   | 0   | 4   | 1   | 8   | 0   | 0   | 1   | 0   | 3   | 35   | 10  | 4   | 40  | 3.5  | 8.75  | 8.33  | 7.07 | 8.59  | 23.99 |

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Table 3: Weeds species in Gharghoda barren land
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|   | TOTAL | 520 | 543 | 90.22 |
Table 4 (a): Parameters analyzed in soil samples of different fields of Gharghoda block of Raigarh district

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<th>Soil type</th>
<th>pH</th>
<th>EC</th>
<th>OC %</th>
<th>Available N kg/ha</th>
<th>Available P kg/ha</th>
<th>Available K kg/ha</th>
<th>Available micronutrients</th>
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Table 4 (b): Levels of parameters analyzed in soil samples of different fields of Gharghoda block of Raigarh district

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<th>OC %</th>
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<td>Low</td>
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<td>Medium</td>
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<td>Low</td>
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<td>Low</td>
<td>Low</td>
<td>Medium</td>
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</table>
Figure 1: Different weed species reported in different areas of study
Study of the antimicrobial effect of the silver nanoparticles against biofilm producing *Staphylococcus aureus* strains

Jaya Bharti1*, Abhishek Mathur2

1Research Scholar, Dept. of Microbiology, Mewar University, Chittorgarh, Rajasthan, India; 2Sr. Scientist, NCFIT, New Delhi & Institute of Transgene Life Sciences, Dehradun (U.K), India

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Abstract: *Staphylococcus aureus* is a leading cause of nosocomial infections and the etiologic agent of a wide range of diseases associated with significant morbidity and mortality. Some of the diseases mediated by this species include endocarditis, osteomyelitis, toxic shock syndrome, food poisoning, and skin infections. Biofilms are well organized and complex aggregate of microorganisms, surrounded by a protective matrix of exo-poly saccharides and can adhere to each other on various surfaces. Because of increase the drug resistance and the side effect of over use of antibiotic, it is necessary to find a suitable agent to reduce the growth of microorganism. Biofilm are known as a significant problem because biofilm formation protects pathogenic bacteria against antibiotics and is one of the main causes of development of chronic infections. Thus biofilm is the main cause of drug resistance in microbial strains. These strains cause pathogenicity to a maximum extent and thus cause resistance against the conventional antibiotics/drugs. Silver is known as an antimicrobial agent and is utilized in several antimicrobials and medications. *Staphylococcus aureus* strains were isolated and screened for biofilm production. In the present investigation, the nano-particles were prepared of Ag1. The biosynthesized silver nanoparticles (AgNPs) were characterized by UV–Vis spectroscopy and Transmission electron microscopy (TEM). UV–Vis spectra of silver nano-particles showed absorption spectra at 450 nm corresponding to the surface plasmon resonance of silver nanoparticles. The size and morphology of the fused nanoparticles were determined by TEM, which shows the formation of spherical nanoparticles in the size range of 5–20 nm. The antibacterial activity of biosynthesized AgNPs, were evaluated by measuring the diameter of zone of inhibition against pathogenic microbial strains and drug resistant *Staphylococcus aureus*. It was also observed that, these nanoparticles were having prominent antimicrobial activity against biofilm forming *Staphylococcus aureus*.

**Key words:** Nanoparticles, antimicrobial activity, silver, drug resistant, biofilm forming *S. aureus*

I. INTRODUCTION

*Staphylococcus aureus* is now seen as an important opportunistic pathogen. This bacterium has become the leading cause of infections related to indwelling medical devices such as vascular catheters, prosthetic joints and artificial heart valves, mainly due to its capacity to form biofilms on such materials thus causing persistent or recurrent infections. Infections of medical implants material are associated with considerable morbidity and costs. These infections are very difficult to eradicate since bacteria in biofilms can be up to 1,000-fold more resistant to antibiotic treatment than the same organism growing planktonically [1]. Another problem is the ability of bacteria to acquire resistance to antibiotics therapy. This arises from the frequent use of antibiotics and mainly those of broad-spectrum. Only a few antibiotics are relatively active against *S. aureus* biofilms, and rifampicin, a transcription inhibitor, is among the most effective molecules for treating biofilm-related infections.

A biofilm is a structured community of bacterial cells that is enclosed in a self-produced polymeric matrix and adheres to an inert or living surface. Biofilm formation on implant surfaces increases the resistance to antimicrobial agents and leads to the therapeutic failure of conventional antimicrobial agents. Vancomycin diffuses slowly into the inner layers of bacterial biofilms; the gradual exposure of the bacterial cells to low concentrations facilitates the development of vancomycin resistance. It should be noted that even among the more susceptible isolates, subpopulations develop resistance and/or intermediate susceptibility to vancomycin after exposure [2]. Bacterial biofilms can be defined as an assemblage of microorganisms. Biofilm formation represents the normal lifestyle of bacteria in the environment, and that all microbes can make biofilms. Bacterial biofilm formation is a two step process- 1. Attachment of bacteria to substrate surface; 2. Formation of multiple layers of biofilm due to cell-cell adhesion [3]. The molecular mechanisms underlying the bacterial biofilm formation is complex and variations exist among different strains. Bacterial teichoic acids play important role in initial step of biofilm formation on medical devices like- Artificial surfaces. Nanoscience is the study of atoms, molecules and objects whose size is on the nanometers scale (1-100nm). Nanotechnology is science, engineering & technology
conducted at the nanoscale, which is about 1-100nm. Nanoscience & nanotechnology are the study and application can be used in other science fields. Nanoparticle research is currently an area of intense scientific interest due to a wide variety of potential applications in biomedical, optical and electronic fields. Nanotechnology may penetrate to biofilms and reduce biofilm formation [4-6]. The dose dependent effect of silver nanoparticles (in the size range of 10-15 nm) on the Gram-negative and Gram positive microorganisms has been studied. Action of silver nanoparticles may be due to the interaction of silver ions with nucleic acids and impairment of DNA replication which results in loss of cell viability and eventually resulting in cell death of bacteria. Silver nanoparticles have been evaluated for their antimicrobial activities against a wide range of pathogenic organisms [7-10].

II. MATERIALS AND METHODS

Collection of samples

Samples viz. Urine, Blood (in sterile sample bottles), and Pus (in Stuart transport medium) were collected. Samples were collected from different hospitals of Delhi-NCR.

Processing of samples

Samples were processed for the isolation and identification of the organism preferably within 2 hours after the collection from the hospitals. Samples were stored at 4ºC till further processing.

Isolation of *Staphylococcus aureus*

*S. aureus* cultures were isolated and maintained in Mannitol salt agar (MSA) at 37ºC. Mannitol salt agar (MSA) is both a selective and differential medium used in the isolation of *staphylococci* strains.

Identification and determination of cultural characteristics of *Staphylococcus aureus*

The isolates were identified on the basis of cultural, morphological, and biochemical characteristics as per Bergey’s Manual of Systemic Bacteriology [11].

Morphological characteristics

A suspected colony were collected from the plate and smear preparation were made on clean glass slide and Gram staining were performed and observed under 100 X objective lens of microscope.

Biochemical characteristics

Various biochemical tests were performed for the identification of *Staphylococcus aureus*. Following biochemical tests were performed:

a) Urea hydrolysis test

Three test tubes were prepared with urea (20 g/L), agar (15 g/L), NaCl (5 g/L), KH₂PO₄ (2 g/L) and phenol red (0.012 g/L) in slant position and were divided into sample, urea control and blank group. Another one test tube were prepared with the same reagents but without urea as bacteria control group. Isolates were streaked on the slant in sample and bacteria tubes. All these four test tubes were kept in 37ºC for 20-22h. Reddish pink or red color of test tube was regarded as positive [12].

b) Starch hydrolysis test

The enzyme amylase was excreted out of the cells (an exoenzyme) into the surrounding media, catalyzing the breakdown of starch into sugars. At first, one starch agar plate were picked up and divided in half. Then the isolates were incubated on the one plate in either a straight line or a zig-zag at 37ºC overnight. After incubation and growth, the plates were flooded with iodine. The appearance of yellow or gold zone around the growth indicated positive result.

c) Galactose hydrolysis test

About 3.7 mg Eosin-ethylene- blue (EMB) media was suspended in sterile distilled water, sterilized in autoclaving at 15 lb (121ºC) pressure for 15 minutes. The autoclave mixture were cooled to (45-50) ºC, poured into sterile petridishes and checked overnight at 37ºC. On the next day growing isolates in Mueller-Hinton broth (MHB) were streaked on overnight checked EMB plates and plates were kept at 37ºC overnight. The appearance of bacteria as green metallic sheen to brown colored colony were regarded as positive result.
d) Oxidase test

Filter paper was soaked with 2 drops of freshly prepared oxidase reagent. Colonies of the test organism were smeared on the filter paper using glass rod. Positive oxidases were indicted by the production of a deep purple/blue color within 10 seconds [13].

e) Catalase test

A drop of hydrogen peroxide was placed on a glass slide. With the use of a sterile wire loop, colonies of the test organism were emulsified in the hydrogen peroxide. Catalase positive reaction was seen by their immediate production of bubbles.

f) Nitrate Reduction Test

Nitrate reduction medium were inoculated with the organism and incubated aerobically at 37°C for 24 to 48 hours. After incubation, α-napthylamine and sulphanilic acid were added. These two compounds react with nitrite and turn red in color. In few tubes nitrate were reduced to ammonia or nitrogen gas. To distinguish between these two reactions, zinc dust were added. Zinc reduces nitrate to nitrite. The tubes will turn red because α-napthylamine and sulphanilic acid are already present in the tube. The test organisms will reduce nitrate. Bright red color after the addition of α-napthylamine and sulphanilic acid and no color change upon the addition of zinc were recorded as positive nitrate reduction test.

g) Carbohydrate Fermentation

In this test, a test tube with an inverted Durham’s tube containing a basal medium and the particular sugar (1% conc.) along with a suitable indicator (Bromocresol purple) was used. The medium were inoculated with the help of a loop containing the test organism and then incubated aerobically at 37°C for 24 to 48 hours. Change in color of the medium from purple to yellow indicates acid production and the fermentation of the particular sugar. The presence of air-bubble in the Durham’s tube indicates gas production. The organisms were tested for sucrose, maltose and mannitol fermentation.

h) Indole hydrolysis

In this test tryptone broth were used containing large amount of tryptophan. In presence of Tryptophanase enzyme tryptophan will hydrolyze into an indole and pyruvic acid. The isolated organisms were inoculated in tryptone broth. All the inoculated and uninoculated (control) tubes were incubated at 37±0.2°C for 48 h. After incubation, 5 drops of Kovac’s reagent were added, a red layer at the top of broth indicates positive test where as no change in color indicated as negative test.

i) Methyl red test

The Methyl Red test involves adding the pH indicator methyl red to MR-VP broth. If the organism uses the mixed acid fermentation pathway and produces stable acidic end products, the acids will overcome the buffers in the medium and produce an acidic environment in the medium. The isolated microorganisms were inoculated in Methyl Red-Voges Proskauer broth. All the inoculated and uninoculated (control) tubes were incubated at 37±0.2°C for 48 h. After incubation, 5-6 drops of methyl red reagent were added. Red color of medium indicates positive test, while no color change in the medium indicated negative result.

j) Vogues- Proskauer test

This test was performed to determine the capability of microorganism to produce non-acidic end products such as ethanol and acetoin (acetyl methyl carbinol) from the organic acid. The isolated microorganisms were inoculated in Methyl Red-Voges Proskauer broth. All the inoculated and uninoculated (control) tubes were incubated at 37±0.2°C for 48 h. After incubation, 12 drops of freshly prepared VP-reagent I (naphthol solution), 2-3 drops of VP-reagent II (40% KOH) were added in all the inoculated and uninoculated tubes. Development of crimson to pink (red) color indicated positive test where as no change in color indicated as negative test.

k) Motility test

This test was performed to check the motility of the bacterium. Tube containing motility agar was stab inoculated. Positive test is indicated by the growth around the stab line that has radiated outwards in all directions while no growth around the stab line indicates negative test.
Phenotypic analysis of slime production of *Staphylococcus aureus*

a) Tube method

*S. aureus* isolates were tested for biofilm production by a modification of the standard method of (Christensen et al., 1982). Two milliliters of tryptase-soy broth (TSB) in 12 x 75 mm borosilicate test tubes were inoculated with a loopful of microorganisms from overnight culture plates and incubated for 48 hours at 37°C, after which the contents were decanted and washed with PBS (pH 7.3) and left to dry at room temperature. Afterward, the tubes were stained with 4% solution of crystal violet. Each tube were gently rotated to ensure uniform staining and then the contents were gently decanted. The tubes were placed upside down to drain and then observed for biofilm formation which was considered positive when a visible film lined the wall and bottom of the tubes. Ring formation at the liquid interface will not be regarded as indicative of biofilm formation [14].

Preparation of silver nanoparticles

For the preparation of silver nanoparticles two stabilizing agents, sodium dodecyl sulphate (SDS) and sodium citrate were used. For the synthesis of silver nanoparticles, silver nitrate solution (from 1.0 mM to 6.0 mM) and 8% (w/w) Sodium Dodecyl Sulphate (SDS) were used as a metal salt precursor and a stabilizing agent, respectively. Hydrazine hydrate solution with a concentrate ranging from 2.0 mM to 12 mM and Sodium citrate (1.0 mM to 2.0 mM) were used as reducing agents. Citrate of sodium was used as stabilizing agent at room temperature. The transparent colorless solution was converted to the characteristic pale yellow and pale red colour, when citrate of sodium was used as stabilizing agent. The occurrence of colour was indicated by the formation of silver nanoparticles. The silver nanoparticles were purified by centrifugation. To remove excess silver ions, the silver colloids were washed at least three times with deionized water under nitrogen stream. A dried powder of the nanosize silver was obtained by freeze-drying. To carry out all characterization methods and interaction of the silver nanoparticles with bacteria, the silver nanoparticles powder in the freeze-drying cuvette were resuspended in deionized water; the suspension were homogenized with a ultrasonic cleaning container [15].

Characterization of prepared nanoparticles via UV- absorption spectra and Transmission electron microscopy (TEM)

The formation of AgNPs and TR-AgNPs by the bioreduction of Ag⁺ to Ag0 was easily monitored using UV–Vis spectroscopy. The scanning was performed in the range of 200–700 nm. The morphology and size were determined by TEM.

Antimicrobial activity of silver nanoparticles against Biofilm forming *Staphylococcus aureus*

1. Agar well diffusion method

The agar well diffusion method was modified [16]. Nutrient agar medium (SCDM) is used for bacterial cultures. The culture medium is inoculated with the bacteria separately suspended in nutrient broth. A total of 8 mm diameter wells were punched into the agar and filled with silver nanoparticles. Standard antibiotic (Erythromycin 1 mg/ml) were simultaneously used as the positive control. The plates were incubated at 37°C for 18 h. The antibacterial activity was evaluated by measuring the diameter of zone of inhibition observed. The procedure for assaying antibacterial activity was performed in triplicates to confirm the readings of diameter of zone of inhibition observed for each of the test organism.

2. Measurement of minimum inhibitory concentration (MIC) and Minimum bactericidal concentration (MBC)

Silver nanoparticles were added in LB medium, respectively. Each bacterium culture *Staphylococcus aureus* were controlled at 10⁵-10⁶ Cfu/mL and incubated at 37°C. To establish the antimicrobial activity of nanoparticles on the bacterial growth, the minimum inhibitory concentration of nano particles for *Staphylococcus aureus* were determined by optical density of the bacterial culture solution containing different concentration of nano particles after 24h. All of the experiments (MIC) were triplicate, on three different days [17]. The minimum bactericidal concentration (MBC), i.e., the lowest concentration of nanoparticles that kills 99.9% of the bacteria were also determined from the batch culture studies. For growth inhibitory concentration (PMIC) the presence of viable microorganisms were tested and the lowest concentration causing bactericidal effect were reported as MBC as suggested [18]. To test for bactericidal effect, a loopful from each flask were inoculated on nutrient agar and incubated at 35°C for 24 h. The nanoparticles concentration causing bactericidal effect was selected based on absence of colonies on the agar plate.

### III. RESULTS AND DISCUSSION

In the present study, amongst 158 clinical samples collected, about 56 samples were found positive of *S. aureus*. The studies were performed to reveal the culture characteristics, gram staining and biochemical characteristics criteria. White colored colonies were observed on nutrient agar medium (Figure 1a) while yellow colored colonies were observed on mannitol salt agar medium (Figure 1b). Gram staining of the pure isolates showed cocci shape and was found to be gram positive (Figure 1c). The study to reveal the biofilm producers from total positive 56 samples, showed the presence of 12 bio-film producers while rest 44 were found non-biofilm producing *S. aureus* strains. The results are shown in Table 1 and Figure 2. The biochemical characteristics of the *S. aureus* strains
were determined. S. aureus isolates showed positive catalase, oxidase, nitrate, galactose and starch hydrolysis. The results are shown in Table 2. Further the phenotypic analysis of S. aureus was done for confirming positive and negative biofilm producers. The results showed, the high/potent; moderate and non biofilm producing strains as per the adhering capability of slimy biofilm layer within the test tubes when stained with 4% crystal violet dye. The results are shown in Figure 3. The silver nanoparticles were prepared as determined by the dark black colored solution from the colorless solution. The results are shown in Figure 4. The sizes of the nanoparticles were determined by SEM as 2µm. The results are shown in Figure 5. Antimicrobial susceptibility of the conventional antibiotics was determined against conventional antibiotics (Figure 6 & Table 3). Antimicrobial activities of the silver nanoparticles were determined at different concentrations (5 and 10 ppm) against biofilm producing S. aureus strains. The results are shown in Figure 7 and Table 4. The results of the present study are in correlation with the previous findings [19-23]. Further studies showed the antibacterial potential of silver nanoparticles against V. cholerae and E. coli [24]. Silver nanoparticles were investigated antimicrobial against Pseudomonas aeruginosa [25]. The shape of nanoparticles influences the aggression of antibacterial behavior [26].

IV. CONCLUSION
The proposed study attempts to describe the production of biofilm formation. Preparation of nanoparticles and its evaluation for antibacterial potential against biofilm producers and biofilm will leads to the stepping stone in area of research in Nano-biotechnology and medical Microbiology. This will lead to the establishment of possible therapeutic approaches to deal with resistant and sensitive strains of Staphylococcus aureus. The present study showed that the silver nanoparticles (AgNp) had prominent antibacterial activity against biofilm producing S. aureus strains in comparison to different antibiotics. The study thus illustrates the new prospects in area of nano-biotechnology through which different nano particles can be created and can be utilized in eradication of drug resistant and sensitive strains of S. aureus.

V. REFERENCES


**Figure 1 (a-c):** Isolation of *Staphylococcus aureus* strains on Nutrient agar medium (NAM) and Mannitol salt agar medium (MSA)

**Table 1:** Number of biofilm and non biofilm *S. aureus* strains isolated

<table>
<thead>
<tr>
<th>Total Positive Samples</th>
<th>Biofilm-forming <em>S. aureus</em></th>
<th>Non-biofilm forming <em>S. aureus</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>12</td>
<td>44</td>
</tr>
</tbody>
</table>

**Figure 2:** Prevalence of biofilm and non biofilm *S. aureus* strains isolated
Table 2: Biochemical tests of S. aureus positive colonies

<table>
<thead>
<tr>
<th>Biochemical Tests</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalase</td>
<td>+</td>
</tr>
<tr>
<td>Oxidase</td>
<td>+</td>
</tr>
<tr>
<td>Nitrate</td>
<td>+</td>
</tr>
<tr>
<td>Galactose hydrolysis</td>
<td>+</td>
</tr>
<tr>
<td>Starch hydrolysis</td>
<td>+</td>
</tr>
<tr>
<td>Indole</td>
<td>-</td>
</tr>
<tr>
<td>M R</td>
<td>-</td>
</tr>
<tr>
<td>V P</td>
<td>-</td>
</tr>
<tr>
<td>Citrate</td>
<td>-</td>
</tr>
<tr>
<td>Motility</td>
<td>-</td>
</tr>
<tr>
<td>Urease</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 3: Screening of Biofilm and non film producing strains of S. aureus
**Figure 4:** Preparation of silver nanoparticles (Ag-Np)

**Figure 5:** Size determination of silver nanoparticles (Ag Np) by SEM
Table 3: Antimicrobial susceptibility of conventional antibiotics against biofilm producing S. aureus

<table>
<thead>
<tr>
<th>Biofilm forming S. aureus strains</th>
<th>Antibiotic</th>
<th>Conc. (µg)</th>
<th>Diameter of zone of inhibition (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strain 1</td>
<td>Ofloxacin (Of)</td>
<td>30</td>
<td>34</td>
</tr>
<tr>
<td>Strain 2</td>
<td>Erythromycin (Er)</td>
<td>30</td>
<td>36</td>
</tr>
<tr>
<td>Strain 3</td>
<td>Amoxicillin (Am)</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Strain 4</td>
<td>Ciprofloxacin (Cf)</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

Figure 6: Antimicrobial susceptibility of conventional antibiotics against biofilm producing S. aureus
**Figure 7:** Antimicrobial activities of silver nanoparticles at 5 ppm (AgNp1) and 10 ppm (AgNp2) against biofilm producing S. aureus strains

**Table 4:** Antimicrobial activities of silver nanoparticles at 5 ppm (AgNp1) and 10 ppm (AgNp2) against biofilm producing S. aureus strains

<table>
<thead>
<tr>
<th>Biofilm forming S. aureus strains</th>
<th>Diameter of zone of inhibition (mm) of AgNp-1 @ 5 ppm</th>
<th>Diameter of zone of inhibition (mm) of AgNp-2 @ 10 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strain 1</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>Strain 2</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>Strain 3</td>
<td>20</td>
<td>28</td>
</tr>
<tr>
<td>Strain 4</td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>
Study of Seasonal variation of fungal biodiversity in polluted Yamuna River from NCR Delhi region, India

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Abstract- The River Yamuna is the largest tributary of River Ganga. This river is as prominent and sacred as the great River Ganga itself. Deterioration in water quality as a result of discharge of allochthonous and autochthonous sources of pollution into water bodies in increasingly rendering the natural water bodies unsuitable for various beneficial purposes to the mankind, like drinking water source, bathing, navigation, fishing and irrigation. It is observed that, due to over pollution of such sacred rivers, the microbial diversity gets increases which increase the BOD and organic load in the water thus making the water polluted. The study showed that the fungal biodiversity is the result of increasing pollution in river Yamuna and is also variable as per the seasonal and climatic variations.

Index Terms- Yamuna river, catchment areas associated with Delhi-NCR, fungal diversity, seasonal variations.

I. INTRODUCTION

The Rivers Yamuna plays an important role in human development of NCR by providing drinking water and making the land fertile. The river passing through Delhi section is terribly polluted Delhi based Centre for Science and Environment has called a sewage canal. Biochemical Oxygen Demand (BOD), the oxygen required to oxidize and therefore purify organic waste. A higher BOD indicates a low level of oxygen and a higher level of pathogen content mainly fungi and bacteria earlier no detail survey of Fungal diversity in river Yamuna carried out The diversity of fungi in Delhi Yamuna is highly influenced by seasonal variation. Delhi experiences extreme weather conditions with subtropical humid climate ranging from extremely hot and long summers to a short monsoon and autumn, extreme cold winters and a short pleasant spring season, these fungal pathogens are cause of different serious human, plant and water animals diseases. A higher BOD indicates a low level of oxygen and a higher level of pathogen (microbial) content. The chronically polluted water contains higher number of different filamentous and aquatic (Zoosporic) group of fungi [1]. Amongst filamentous fungi causes many problems to health and leads to severe diseases to human population living along the catchment area of the river and the cities. The diseases due to filamentous fungi can cause of invasive Aspergillosis (IA), chronic granulomatous disease (CGD), pneumonia and pericardial tamponade, tinea capitis, ocumbomyosis, abdominal zygomycosis , mycotic keratitis, pericarditis in a patient with acute leukemia, Subcutaneous hyalohyphomycosis, liver necrosis, nephritis and irritation of the gastrointestinal mucosa, nasal mucous membrane ulcers, dermatitis and cancer and induces allergic reactions. Fungi may also cause conjunctivitis, eosinophilic, pneumonitis, and a potential human carcinogen resulting into lungs and nasopharyngeal cancers. Aquatic (Zoosporic) group of fungi Chytrides kills water amphibians while; Saprolegnia and Achlya are common and widespread fungal killers of fishes [2-5]. In view of this fungal diversity in different season of Delhi Yamuna was carried out. The present study was performed in order to determine the fungal diversity in river Yamuna associated with catchment areas of Delhi-NCR with reference to different seasonal variations.

II. MATERIALS AND METHODS

In the present study, soil and water samples were collected from each of the five different locations viz. Khyber Pass, ISBT, Maharani Bagh, Kalkaji and Sarita Vihar of Yamuna river bank. These samples were stored and kept in icebox during the transportation to the laboratory. The screening of different filamentous fungi was done by adopting conventional (1) Spread plate technique and (2) Dilution platting technique in four replicates [6].

III. RESULTS AND DISCUSSION

A total of 704 different fungal colonies observed. Out of which, 26 different genera of fungi and 54 different species identified. Samples collected during winter (December 20015 and Jan2016) when temperature recorded between 5º to 25º C the highest diversity (4.90 %) was recorded for Arthoderm album, Trichoderma harzianum, and T viride, followed by (3.92% )in Aspergillus sclerotiorum , Chrysosporium keratinophilum, Penicillium expansum, P. oxalicum, Phoma sorghina, Trichophyton. tonsurans. 2.94% in Acremonium byssöide, Microsporum canis, Penicillium chrysogenum, Synechococcarn ram racemosum , Trichoderma harzianum, T. koningi, , Trichothecium roseum, Verticillium alboatrum , Verticillium lilacinus .followed by (1.96%) in Aspergillus candidus, A. nidulans, A. ochraceous, A. oryzae, Cladosporium cladosporioides, Curvularia pallescence, Paecilomyces variotii, Penicillium digitatum and Rhizopus stolonifer. 0.98% in Acremonium stictum, Alternaria alternata, Aspergillus sydowi, A terreus,. Chaetomium globosum, Chrysosporium indicum, Cladosporium herbarum, Colletotrichum gloeosporioides, Drechslera sativum, Epicoccum purpurascens, Fusarium oxysporum , Mucor recemosus, Myrothecium roridum,
Paecilomyces lilacinus Penicillium citrinum and , P citrinum. While no growth (0.00%) recorded in Absidia corymbifera, Aspergillus niger, A. flavus, Chaetomium indicum, Curvularia lunata Drechslera rostrata, Fusarium pallidoroseum, Malebranche gypseum, and Thielavia terricola.

During the Spring 2016 (Feb to March) when temperature recorded between 20° to 25°C the highest diversity recorded (3.75%) in Epicoccum purpurascens Paecilomyces lilacinus, Penicillium oxalicum, P. digitatum, Phoma sorghina Rhizopus stolonifer Drechslera viride and T. virens. 1.25% in Alternaria alternata Colletotrichum gloeosporioides, Drechslera rostrata Fusarium oxysporum Fusarium pallidoroseum Fusarium solani, 0.62% in Arthrodema album Aspergillus nidulans Curvularia pallescence and no growth 0.00% in Absidia corymbifera. Acremonium stictum Aspergillus niger Aspergillus ochraceous, A. sydowi, A. terreus, Cladosporium herbarum, Thielavia terricola 3.12% in Mucor racemosus and least (0.62%) in Mucor recemosus, Paecilomyces lilacinus, Penicillium oxalicum, Phoma sorghina, Rhizopus stolonifer Trichoderma harzianum, Penicillium oxalicum and Rhizopus stolonifer followed to (2.0%) in Acremonium stictum, Alternaria alternata, Aspergillus flavus, A niger A. ochraceous, A. sydowi, A. terreus, Cladosporium cladosprioides, C. herbarum, Cladosporium globosum, C. keratinophilum and C. keratinophilum.

During Summer 2016 (April to June) when temperature range was 25° to 45°C the highest diversity 5.48% was observed in Aspergillus oryzae followed by 4.87% in Aspergillus sclerotiorum and Drechslera specifer 4.26% in Aspergillus candidus 3.75% in Absidia corymbifera. Aspergillus flavus, A. nidulans, A. sydowi, Curvularia lunata, and Thielavia terricola 3.12% in Mucor recemosus and 2.50% in Alternaria alternata, Aspergillus niger, A. ochraceous, A. terreus, Penicillium oxalicum, Phoma sorghina, Synecephastrum racemosum, Trichoderma harzianum, T. coningi, Trichothecium roseum, Verticillium alboatrum and V. lilacinus followed to 1.87% in Chaetomium globosum, Epicoccum purpurascens Fusarium oxysporum Fusarium pallidoroseum. 1.25% in Arthrodema album Acremonium keratinophilum, Colletotrichum gloeosporioides, Curvularia pallescence, Fusarium equeseti Microsorum canis, Paecilomyces variotii, Trichophyton. tonsurans Rhizopus stolonifer, Trichoderma virens, Penicillium expansum, and least (0.62%) recorded in Trichoderma viride, Cladosporium herbarum, C. keratinophilum, Drechslera sativum Fusarium solani, Malebranche gypseum, Malebranche gypseum, Paecilomyces lilacinus, Penicillium citrinum, Cladosporium cladosprioides. While no growth (0.00%) observed in Acremonium byssoides, A. stictum, Myrothecium roridum and Penicillium digitatum.

During Monsoon 2016 (July to Sept) when temperature range between 30° to 35°C, the highest diversity 8% in Aspergillus terreus followed to (3.75%) in Aspergillus candidus Aspergillus flavus and Acremonium stictum then 3.12%, Alternaria alternata 2.50% Aspergillus niger Drechslera specifer and Aspergillus ochraceous, followed to 1.87% in Thielavia terricola, Aspergillus sydowi, Curvularia lunata Malebranche gypseum and Aspergillus nidulans; 1.25% in Verticillium alboatrum, Epicoccum purpurascens, Fusarium equeseti, Mucor recemosus, Paecilomyces lilacinus, Penicillium citrinum, P. oxalicum, Phoma sorghina, Rhizopus stolonifer, Synecephastrum racemosum, Trichoderma virens, T. coningi, Colletotrichum gloeosporioides and least 0.62% in: Arthrodema album, Acremonium keratinophilum, Cladosporium cladosprioides Fusarium pallidoroseum, F. solani Microsorum canis, Drechslera sativum, Curvularia pallescence, Chaetomium globosum, Myrothecium roridum, Paecilomyces variotii, Trichoderma viride, Trichothecium roseum, Trichophyton. tonsurans, Trichoderma harzianum Verticillium lilacinus. While no growth observed in Acremonium byssoides, Cladosporium herbarum, C. keratinophilum, Drechslera rostrata Fusarium oxysporum, Penicillium chrysogenum and P. digitatum.

During Autumn 2016 (Oct to Nov) when temperature was between 20° to 30°C maximum diversity (3.33%) recorded in Drechslera sativum Fusarium pallidoroseum F. solani, M. Microsorum canis followed to (2.66%) in Absidia corymbifera, Aspergillus oryzae, C. keratinophilum, Colletotrichum gloeosporioides, Drechslera rostrata, Epicoccum purpurascens, Fusarium oxysporum, Paecilomyces lilacinus, Penicillium citrinum, P. oxalicum and Rhizopus stolonifer followed to (2.0%) in Acremonium stictum, Alternaria alternata, Aspergillus flavus, A niger, A. ochraceous, A. sydowi, A. terreus, Cladosporium cladosprioides, C. herbarum, C. keratinophilum, Myrothecium roridum, M. Microsorum canis, Penicillium digitatum, P. expansum, Phoma sorghina, Trichoderma coningi, Verticillium alboatrum followed to (1.33%) in Acremonium byssoides, Arthrodema album, Aspergillus candidus, A nidulans, A sclerotiorum, Chaetomium globosum, Curvularia pallescence, Drechslera specifer, Fusarium equeseti, Myrothecium roridum, Paecilomyces variotii, Trichoderma harzianum, T. virens, Trichothecium roseum, Verticillium lilacinus and least (0.66%) in Curvularia lunata, Penicillium chrysogenum, Synecephastrum racemosum, Cladosporium viride, Trichophyton. tonsurans. While no growth 0.00% observed in Malebranche gypseum and Thielavia terricola. The results are shown in Table 1 and Figure 1. Terrestrial fungi in aquatic habitats are likely to originate from air as well as from living or dead animal and plant, soil and litter being in contact with water. Different fungi were predominantly isolated from Turkey rivers viz. Aspergillus, Cladosporium, Epicoccum, Penicillium and Trichoderma species appear in comparison to Epicoccum, Cladosporium and Trichoderma. Aspergillus fumigatus, A niger, Penicillium chrysogenum and many other species [7-14].
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Seasonal effect on diversity of fungi of polluted Yamuna river from catchment areas of Delhi-NCR

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Figure 1: Seasonal effect on diversity of fungi of polluted Yamuna from Delhi catchment areas
REFERENCES


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Behaviours of Law Enforcement Agencies That Affect the Life Style of Street Children

Mugove Kudenga

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Abstract- This is part of a broad research that sought to find out the perceptions of street children on law enforcement agents. This study focused on behaviours of law enforcement agencies that affect the life styles of street children. Law enforcement agencies are mandated by the state to make sure every citizen abides by the law. They at times, in the course of their duty have to enforce the law by restricting the behaviours of street children that are against the law. The main research objective of this study was to identify the activities of law enforcement agents on street children that affected the lifestyle of street children. The study used qualitative methodology. A descriptive survey research design was used. The research used semi-structured interviews and observations as instruments to collect data. The sample composed of ten street children selected by purposive sampling in the streets of Harare. The study revealed that law enforcement agents were very cruel, heartless and corrupt towards street children though there were some street children who indicated that some law enforcement agents were sometimes helpful to street children. The researcher recommended that law enforcement agents be offered training on how to handle children living on the streets. There is need for Government to put in place programmes which look at and promote the welfare of children living in the streets. The researcher also recommended that any violation of the rights of children living in the streets be brought to book and perpetrators prosecuted. The law enforcement agents should continue with the positive work of referring street children for rehabilitation.

Index Terms- Law enforcement agencies, perceptions, street children, rehabilitation, rights of children.

I. INTRODUCTION

Law enforcement agencies of any country are mandated by the country’s constitution to enforce the various laws of the country. In pursuant of their mandated duties they come across some activities of street children that are against the laws the country. It is when they will be enforcing the law that the street children perceive the law enforcement agencies to be disturbing their way of life. The street children due to their lack of knowledge of their social expectations will be doing activities that disturb other citizens of the country. In the process of trying to make sure there are no social disturbances the law enforcement agencies try to reign in the activities of street children so that they are in compliance with social expectations. It is these activities of trying to reign in activities of street children that are contrary to societal expectations that affect the usual lifestyle of the street children. It is the purpose of this study to find out the activities of law enforcement agencies that affect the lifestyle of street children.

RESEARCH QUESTION

Which activities of law enforcement agents affect the lifestyle of street children?

LITERATURE REVIEW

Definition of street children

In Zimbabwe the Child Protection and Adoption Act (1996) considers children to be anyone below the age of eighteen. It puts them in two categories which are ‘a child’ and ‘a young person’. A child is considered to be any person under the age of sixteen years and includes an infant. A young person is considered to be any person who has attained the age of sixteen but has not yet attained the age of eighteen years. In this study the term child is going to be considered as any person who has not yet reached the age of eighteen. This will include a young person. The concept of ‘street children’ and/or ‘street kid’ according to Michaleon (2006) encompasses any child or adolescent under the age of eighteen who works and/or lives in the streets or outside the normal family environment. Glasser, (1994) states that street children include any girl or boy for whom the street has become his or her habitual abode and or a source of livelihood, and who is inadequately protected, supervised or directed by responsible adults.

The United Nations (2008) further defined street children as children on the streets who are engaged in some kind of economic activity during the day but return to their family home at night (UNICEF 2008). United Nations (2008) describes children of the street as those children who mostly survive on the street or outside the normal family environment. The concept of ‘street children’ and ‘street kids’ referring street children for rehabilitation.

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instances these children have left their homes due to various reasons that include fleeing from abuse or having no one to take after both parents have died. They then spend most of their lives in the street. In the streets they do not have adult figures to look up for guidance and nurturance.

In the present study the concepts of ‘street children’ or ‘street kids’ are used to mean the same as was adopted by Rialp (1991) at The Inter-Non Governmental Organisation Conference in Switzerland which regarded them as boys and girls who have not yet reached adulthood for whom the street has become their habitual abode and or source of livelihood and who are inadequately protected, supervised or directed by responsible adults. The concept and definition will apply to both categories of children discussed above. In the context of this study, boys and girls who have not yet attained the age of eighteen, which is the legal age of majority in Zimbabwe. Those under the age of eighteen are legally considered to be minors and should be dependent on adults for most of their needs. These adults could be parents, relatives or other people who can be legally responsible for the needs of such children.

Types of street children

Street children are categorised into two groups according to the United Nations definitions. The first type is of children who are homeless, resides in the streets in the urban areas and their source of livelihood are the streets on which they sleep and live in. The second type is those who work and live in the street during daytime but return back home at night where they sleep. The second type occasionally sleep in the streets and has some contact with their families (UNCHS 2000). The congruency between the two definitions from the United Nations is that the children obtain their source of livelihoods from the streets. They earn money and food from activities they do in the streets. Ruparanganda (2008) alluded that the street is a source of street children’s livelihood. Beazley (2003) cited that street childhood has invariably been seen as a career as it is a source for the children’s survival. These children would be inexperienced from how to run their lives and in turn resort to criminal activities and run cat and mouse games with law enforcement agencies.

Perception of Street Children in Zimbabwe

In both developing and developed countries worldwide the problematic phenomenon being faced by these countries is that of street children. It is threatening to these societies as it defies the normal way of raising children in a family and it needs to be addressed, lest it continues to rack havoc in communities.

In Zimbabwe children living in the street have threatened the lives of many city dwellers. This is evidenced by a story carried out in one of the local papers, Herald of 8th May 2013 which carried out a story titled ‘Hell on Harare’s streets’. The paper stated that more and more street children continue to pour in the streets of Harare. The paper also indicated that children have turned nasty as they targeted hopeless women, grabbing food and many have been arrested for shoplifting in supermarkets. Some street kids are reported to have targeted women’s handbags, phones, jewellery and other personal belongings. The Herald reported that the police were forced to come hard on these street kids as they tried to deal decisively with the problem.

Childline Zimbabwe spokesperson Mrs Patience Chiyangwa called for authorities to address the problem. She encouraged people to desist from giving the street children money. (The Herald, 8th May 2013) She was quoted saying, “It is important that members of the public desist from giving cash as this encourages them to stay on the streets. Preferably, if they can have more sustainable solutions to the problem that would be welcome. The more there is a feeling of begging as a lucrative exercise, the more we prolong the problem”. (The Herald 8th May 2013)

The phenomenon of street children is widespread in Harare just like in many cities around the world. The law enforcement agents are at task to maintain law and order in the streets, rounding up these children and handing them over for rehabilitation.

Activities of law enforcement agents on street children?

Law enforcement agents are involved in various activities in the streets. Office of the High Commissioner for Human Rights Report (2004) mentioned that police officers and guards in Uganda periodically order general roundups of street children throughout the country. Smith and Wakia (2012) stated that many governments had taken extreme steps to clear the streets of the children without offering any alternative option. These roundups usually occur ahead of special events, official visits, international conferences, or are a way for the ministry to be seen to be tackling the perceived “problem” of street children.

Office of the High Commissioner for Human Rights (2004) further stated that at various times, police around the country have detained large groups of up to 100 children without charge in police stations with adults. These roundups often occur at the behest of the ministry of gender and other officials. Many children are released back to the streets after several days, or in some cases weeks, often only after paying a bribe or being forced to work for the police while in custody, including cleaning. A Police Unit tasked to address child abuse and neglect in Uganda told Human Rights Watch in July 2014 that in Kampala police are asked to provide security during round up operations.

A report by Human Rights Watch Children's Rights Project (1996) stated that Indian street children are routinely detained illegally, beaten and tortured and sometimes killed by police. Benitez (2007) stated that police conducted periodic roundups of children, extortion, threats, physical abuse, victimization, rape and murder by police officers has been documented time and again. Several factors contribute to this phenomenon. The same report mentioned the following: police perceptions of street children, widespread corruption, a culture of police violence, the inadequacy and non-implementation of legal safeguards, and the level of impunity that law enforcement officials enjoy. The police generally view street children as vagrants and criminals. While it is true that street children are sometimes involved in petty theft, drug trafficking, prostitution and other criminal activities, the police tend to assume that whenever a crime is committed on the street, street children are either involved themselves or know the culprit. Their proximity to a crime is considered reason enough to detain them. This abuse violates both Indian domestic law and international human rights.
standards. (Human Rights Watch Children's Rights Project 1996). In Zimbabwe the ZRP have also done similar operations to remove children in the streets ahead of some important official visits and at times to curb the increase in crimes of violence such as robbery and theft.

II. METHODOLOGY

This study used qualitative methodology. It employed the descriptive research design. This method was used as the researcher felt it was the most ideal for the study. The descriptive survey research designs are defined by their methodical collection of standardised information from any representative sample of the population (Christensen, 1994). In addition, this research design suits the context under which the present study was taken as the descriptive survey represents a probe into a given state of affairs that exists at a given time. It therefore means that direct contact was made with the individuals whose characteristics, behaviours and issues were relevant to the investigation under study. In this case the researchers had direct contact with the street children. It allowed the researcher to choose from a wide variety of instruments and in this research it was the interview schedule.

This research design has the advantage of the researcher being in direct contact with the research participants who were children living in the streets. The direct contact affords the researcher to be able to observe other information like non-verbal cues in the form of voice tone and facial expressions that quantitative techniques cannot capture. Data collected using descriptive survey method can be easily summarised and analysed.

This research design has the disadvantage of the researcher becoming carried away when carrying interviews. This occurs when a researcher encounters a case which touches ones heart a case likely to occur when working with street children. This problem was overcome by formulating questions in the interview schedule that were clear to the respondents so that answers required needed no much explanation.

Sampling involves selecting people from the population to represent the entire population, (Polit 2001). Purposive sampling was utilized in this study and the best available people provided rich data on the research questions. Polit (2001) describes purposive sampling as selecting participants with a broad general knowledge on the topic or those who have undergone the experience. The researcher selected ten (10) street children who resided or operated from the streets of Harare Central Business District. The participants were selected on the basis that they had had contact with law enforcement agencies in one way or another. This could have been by having been rounded up or having been arrested.

The data was collected through the use of a semi-structured interview. McNamara (1999) states that in an interview the interviewer can control the response situation scheduling with the participation of the respondents to be mutually agreeable in time, place and the controlling of the question pace and sequence to suit the circumstances of the situation. Interviews are adaptable and help in creating trust and good rapport with the respondents. Interviews also allow the researcher to probe further there is feeling that the respondent has not given an adequate answer or there is need to explore an issue more deeply. In order not to disturb the flow of questions the data was recorded electronically. Few notes were taken to keep track of the interview.

III. RESULTS

Activities of law enforcement agents on the street children

The study investigated the activities of law enforcement agents on street children. The study revealed that seventy percent of the respondents said law enforcement agents carry out round ups on street children. One of the respondents said,

Excerpt 1

"Sometimes they take all street children off the streets and dump them far away. At one time I was taken with my friend to Harare Central Police Station where we ended up being transported in a lorry to Masvingo".

Forty percent of the respondents mentioned that law enforcement agents arrest street children. According to this study, those arrested were arrested for theft, selling drugs, vending and assault. One of the respondents was asked whether he was ever arrested and he said,

Excerpt 2

"Yes, several times. I was arrested for selling mbanje. At one time I was arrested for theft.”

The study indicated law enforcement agents were involved in raiding street children who will be vending in the streets.

Excerpt 3

"Some municipal officers raid us when vending the most painful thing is that they take away our products. They do not pay anything. If you try to follow you will be beaten.”

Excerpt 4

"Police officers and municipality officers run battles with us. We really wonder what wrong we will have committed? They often patrol the streets and raid vendors. Taking their ware for free”

The study also revealed that law enforcement agents after they had rounded up street children they referred the street children for rehabilitation.

Excerpt 5

"At one time we were taken to Harare Central Police in a lorry and the police liaised with social welfare so that some of us would go to homes. The life at the homes is very boring. There is no entertainment. Most of the times children are made to work “

Excerpt 6

"Police officers remove us from the street and load us in lorries. Sometimes we are taken to Harare Central Police Station where some children are referred to children’s homes. I was once referred to a home for rehabilitation but I ran away. The place was unpleasant and we were made to work for nothing “
The following table shows the activities of law enforcement agents.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round ups</td>
<td>7</td>
<td>70</td>
</tr>
<tr>
<td>Arrests</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Raids</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Refer children for rehabilitation</td>
<td>3</td>
<td>30</td>
</tr>
</tbody>
</table>

Seventy percent of the respondents said law enforcement agents rounded up street children from the street. Forty percent said they arrest and raid street children and only thirty percent said they rehabilitate street children.

**IV. DISCUSSION**

Findings from the study revealed that law enforcement agents were involved in rounding up street children from the streets of Harare. Seventy percent of the children interviewed said police officers and municipality police rounded up children from the streets and took them to Harare Central Police Station. The children were loaded in lorries and then off loaded at the police station. This finding concurs with results of a study by Human Rights Watch in Uganda in 2013 in which it documented that the police rounded-up street children during which street children were arrested, taken to police posts, central police stations, or taken to either remand homes or to Kampiringisa National Rehabilitation Centre. The children were then either detained, released, or attempts made to resettle them. Rurevo and Bourdillion (2003) found out that trying to solve the problem of street children by forcibly removing street children from the streets and putting them in rehabilitation centers had not yielded the required results. The street children in most instances would escape from the rehabilitation centres and find their way back into the streets. This study found out that the street children resented being made to work and being compelled to follow routines. The findings were similar because they were from different geographical locations which are in the central business districts of Harare and Kampala the street children enjoyed almost similar environments of being in an urban setting. The street children resented being arrested when they had not committed any crime. The law enforcement agencies said the street children had committed a crime of loitering which they did not understand. The street children did not understand what was meant by loitering. They thought it was unfair to arrest them when they had stolen or beaten some one. This means there is need to educate the street children on aspects of the law that affected them so that they make informed decisions. The street children were in most cases treated roughly by law enforcement agencies. At the police station the street children were in most instances inhumanly treated or treated like hardcore criminals. They were put in the same cells with people who had committed crimes like robbery, theft or rape. They considered it unfair especially taking into consideration their age. Such treatment in most instances led the street children to put the law enforcement agencies in bad light.

The study revealed that forty percent of the children said they had been arrested by law enforcement agents at one time or the other. Police arrested street children who were involved in petty crimes like thefts, shoplifting, assaults and selling or abuse of drugs. Law enforcement agents clamped down hard on street children if something was stolen and was not recovered. This was also found by Human Rights Watch Children's Rights Project (1996) when it reported that the police generally viewed street children as vagrants and criminals. It mentioned that the police tended to assume that whenever a crime was committed on the street, street children were either involved themselves or knew the culprit. Their proximity to the scene of a crime was considered reason enough to detain them. The findings were similar because the background and circumstances that the street children were in was the same. The street children are found almost everywhere in the city involved in vending, begging, doing menial jobs or just moving around.

This study also revealed that law enforcement agents were involved in raiding vendors in the streets. Among these vendors there were street children. Forty percent revealed that they were raided in the streets whereby police officers took away their products which they will be selling in the streets. This annoyed the street children especially when they considered that by vending they will be making efforts to earn an honest living instead of shoplifting or stealing. Another study by Mhizha in 2010 reported that the street-working children who engaged in vending appeared no different from their non-street living peers as they were always on the lookout for the municipal and national police. These street children were usually arrested for vending and made to pay fines though the fine was very low. The embarrassment which street children suffered was very frustrating.

**V. CONCLUSIONS**

The study made the following conclusions:

- The results have shown that law enforcement agents carried out round ups on street children. The round ups are done indiscriminately.
- Police officers arrested some of the street children charging them criminal offences like theft, vending abusing drugs and loitering.
- The street children did not understand some of the crimes they were being arrested for. This was so especially in the crimes of loitering and vending.
- Results have shown that law enforcement agents assist the street children by referring them to the department of social welfare where they are taken to safe houses and rehabilitation centres.
- The street children did not enjoy the life at rehabilitation centres. They detested the aspect of being made to work.
VI. RECOMMENDATIONS

The study made the following recommendations after considering the results:

- The researcher recommends that law enforcement agents be offered training on how to handle children living on the streets. This will assist in reduction of abuses perpetrated by law enforcement agents on street children and improve their appreciation of the culture of poverty and the need to address its symptoms within the family and thereby promoting family-based treatment.
- Rehabilitation centres have to have facilities that enticing to the street children so that they do not appear to be like prisons. It is important for the staff at rehabilitation centres to explain to the street children why they are made to perform some tasks.
- There is need for campaigns to be made among street children making them aware of possible crimes they will liable to commit by merely staying in the streets.
- There is need for law enforcement agencies to devise more human ways of getting information from from street children besides rounding them up indiscriminately when a crime has been committed where they will be operating.
- Street children need to be made aware of legal ways of earning a living so that they do not have problems with law enforcement agencies.

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Behaviours of Street Children That Attract the Attention of Law Enforcement Agencies

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Abstract: This is part of a broad research that sought to find out the perceptions of street children on law enforcement agents. This study investigated the behaviours of street children that attracted the attention of law enforcement agencies. Children who live in the streets due to lack of adult figures who give them guidance behave in ways that are against the laws of the country. Such behaviours attract the attention of law enforcement agencies who are mandated by the state to make sure all citizens of the state live according to the expectations of the law. The main research objective was to identify the activities of street children on the streets that attracted the attention of law enforcement agencies. The study used qualitative methodology. A descriptive survey research design was used. The research used interviews and observations to collect data. The sample composed of ten street children selected by purposive sampling in the streets of Harare. The found out that street children were involved in some illegal activities that included consumption of liquor in public places, snatchings handbags from unsuspecting women, shoplifting, fighting in public places, intimidating people who will have refused to give them money and speaking obscene words in public. The research recommends that street children be given life skills so that they do not depend on begging. There is also need for them to taught ways of peaceful coexistence with other street children and members of the public. Street children have to be conscientised on the dangers of abusing intoxicating drugs and taught ways of containing the vagaries of weather.

Research Question: What activities are engaged by street children that attract the attention of law enforcing agents in the streets of Harare, Zimbabwe?

I. Introduction

Children who stay in the streets do so without the guidance of adult figures who are cognizant of the expectations of society. They are usually under the leadership of older street child. Beazley (2003) and Kudenga (2016) concur saying in the streets the socialising role of parents and guardians is taken over by older street children who will be in the street. According to Kudenga (2016) these older street children due to their circumstances end up misinforming the young street children as they are also ignorant of various social expectations. This lack of appropriate guidance predisposes street children to perform activities that attract the attention of law enforcement agencies.

II. REVIEW OF RELATED LITERATURE

Definition of street children

In Zimbabwe The Child Protection and Adoption Act (1996) considers children to be anyone below the age of eighteen. It puts them in two categories which are ‘a child’ and ‘a young person’. A child is considered to be any person under the age of sixteen years and includes an infant. A young person is considered to be any person who has attained the age of sixteen but has not yet attained the age of eighteen years. In this study the term child is going to be considered as any person who has not yet reached the age of eighteen. This will include a yin this study the term child is going to be considered as any person who has not yet reached the age of eighteen. This will include a young person.

The concept of ‘street children’ and/or ‘street kid’ according to Michaleon (2006) encompasses any child or adolescent under the age of eighteen who works and/or lives in the street alone or with his or her family or asylum seekers who are technically homeless and without support. In Zimbabwe the concept of asylum seekers who come in large numbers are rare. They were last experienced during the 1980’s during the times when there was political instability in Mozambique. This group is not included in the present study.

According to the Inter-Non Governmental organisation report cited in a United nations Journal (UNCHS 2000:73) street children are defined as:-

“Any girl or boy...for whom the street has become his or her habitual abode and or a source of livelihood, and who is inadequately protected, supervised or directed by responsible adults”.

The United Nations (2008) further defined street children as children on the streets who are engaged in some kind of economic activity during the day but return to their family home at night (UNICEF 2008). United Nations (2008) describes children of the street as those children who mostly survive on the street or outside the normal family environment. Glasser, (1994) states that street children include any girl or boy for whom the street has become his or her habitual abode and or source of livelihood, and who is inadequately protected, supervised or directed by responsible adults. Rede Rio Crianca (2007) preferred to refer street children as children for whom the street is a reference point and has a central role in their lives. In most instances these children have left their homes due to various reasons that include fleeing from abuse or having no one to take after both parents have died. They then spend most of their lives in the street. In the streets they do not have adult figures to look up for guidance and nurturance.

In the present study the concepts of ‘street children’ or ‘street kids’ are used to mean the same as was adopted by Rialp (1991) at The Inter-Non Governmental Organisation Conference in Switzerland which regarded them as boys and girls who have

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not yet reached adulthood for whom the street has become their habitual abode and or source of livelihood and who are inadequately protected, supervised or directed by responsible adults. The concept and definition will apply to both categories of children discussed above. In the context of this study, boys and girls who have not yet reached adulthood, mean those children who have not yet attained the age of eighteen, which is the legal age of majority in Zimbabwe. Those under the age of eighteen are legally considered to be minors and should be dependent on adults for most of their needs. These adults could be parents, relatives or other people who can be legally responsible for the needs of such children.

Types of street children
Street children are categorised into two groups according to the United Nations definitions. The first type is of children who are homeless, resides in the streets in the urban areas and their source of livelihood are the streets which they sleep and live in. The second type is those who work and live in the street during daytime but return home at night where they sleep. The second occasionally sleep in the streets, (UNCHS 2000). The congruency between the two definitions from the United Nations is that the children obtain their source of livelihoods from the streets. Ruparanganda (2008) alluded that the street is a source of street children’s livelihood. Beazley (2003) cited that street childhood has invariably been seen as a career for the children’s survival. These children would be inexperienced from how to run their lives and in turn resort to criminal activities and run cat and mouse games with law enforcement agencies.

Perception of Street Children in Zimbabwe
In both developing and developed countries worldwide the problematic phenomenon being faced by these countries is that of street children. It is threatening these societies and it needs to be addressed, lest it continue to havoc them.

In Zimbabwe children living in the street have threatened the lives of many city dwellers. This is evidenced by a story carried out in one of the local papers, Herald of 8th May 2013 which carried out a story titled ‘Hell on Harare’s streets. The paper stated that more and more street children continue to pour in the streets of Harare. The paper also indicated that children have turned nasty as they targeted hopeless women, grabbing food and many have been arrested for shoplifting in supermarkets. Some street kids are reported to have targeted women’s handbags, phones, jewellery and other personal belongings. The Herald reported that the police were forced to come hard on these street kids as they tried to deal decisively with the problem.

Childline Zimbabwe spokesperson Mrs Patience Chiyangwa called for authorities to address the problem. She encouraged people to desist from giving the street children money. (The Herald, 8th May 2013.) She was quoted saying,

“It is important that members of the public desist from giving cash as this encourages them to stay on the streets. Preferably, if they can have more sustainable solutions to the problem that would be welcome. The more there is a feeling of begging as a lucrative exercise, the more we prolong the problem”. (The Herald 8th May 2013)

The phenomenon of street children is widespread in Harare just like in many cities around the world. The law enforcement agents are at task to maintain law and order in the streets, rounding up these children and handing them over for rehabilitation.

Activities of street children on the streets.
Mean jobs
Street children are most evident in large cities, where they work in occupations that bring them into contact with the public, both the local population and foreign tourists. To earn a living street children are engaged in various mean jobs. The range of these mean jobs include begging, collecting rubbish for recycling, scavenging rubbish dumps, shoe shining, flower or magazine and newspaper sales and the less visible petty theft. In some of these occupations children work alone, although they frequently are under the control of adults, older street children or gangs. They engage in these various works with or without knowledge of their parents.

Many working children may be under coercion to deliver a certain amount of money each day. Ruparanganda (2008) suggested that the street is an important source of street children’s livelihood. These street children engage in loading and offloading goods from vehicles, cleaning the backyards of supermarkets, herding cattle for some company executives and cutting grass and hedge at the homes of many business executives (Ruparanganda 2008).

The Social Learning Theory helps to explain how street children become involved in these various activities. The younger children copy from their peers on how to survive on the streets. According to Bandura (1997) social learning theory emphasises the importance of observing and modelling the behaviours, attitudes and emotional reactions of others. Whilst in the street the child easily adapts to the situation by seeing what others are doing and then practising it themselves. Most children come to the street without knowledge of doing some jobs in order to earn a living but as a result of them seeing their peers doing the jobs they end up doing the same. This was supported by the behaviourists in Rukuni (2000) who stated that environment shapes one’s behaviour. Street children come to the streets without any skills on begging but merely staying there for a short time one would be a wizard in begging.

A study carried out in Egypt in 2003 reported that children work as vendors, porters, domestic help, or labourers in homes, small restaurants, and other businesses, in order to get money for food. They were paid little for long hours and physically demanding work. In Zimbabwe it is the same situation street children engage in some mean jobs such as wash/guard cars, vending sweets, cigarettes’, juice cards, vegetables etc to earn a living. As a result of poverty, these children leave their homes to look for income in the streets and come back home during the night with some money to feed their siblings. Some chose to stay in the streets forever and run away from poverty within their families.

In order to get money easily without working for many hours the girls then resort to prostitution as a source of living.
Prostitution
A research carried out in Egypt in 2004 by Human Rights Watch revealed that some children living in the streets were victims of commercial sexual exploitation. The children in the street at times engage in sex work to survive. The research further revealed that both boys and girls faced rape and sexual assault by men and older street boys. Street children told Human Rights Watch that they rarely reported crimes committed by their peers or adults to the police, fearing reprisals from the others on the street, or punishment by the police. (Human Rights Watch 2003)

From the interviews conducted with various stake-holders that deal with children living in the street cited by Motala and Smith (2003) it was clear that many children living on the streets are sexually active, but this takes on different meanings in different situations. Some children turn to sex with their fellow street dwellers for comfort, protection and a sense of belonging. For others sex is a source of income and material support. The girls reported that they sometimes received food from the boys living on the street and in exchange, some boys expect sex. According to Motala and Smith (2003) only one of the girls in the sample, Gcina, stated that she had been involved in sex work.

She said she never went looking for 'clients' but provided sex to men she knew, in return for food. She is usually only given enough food for one day. (Motala and Smith 2003). Makope (2006) reports that there is a high risk of contracting sexually transmitted diseases for children living in the streets. Makope (2006) further states that the children living in the streets survive through marginal and illegal activities such as stealing, begging, prostitution and doing odd jobs and they face violence, abuse and aggression from the police, from drunks and also from their peers. In support of this Swart-Kruger and Donald (1994) states that children living in the streets have a greater vulnerability to rape and HIV infection by virtue of living in the streets without parental guidance.

At times children in the street engage in sexual activities whilst they are intoxicated with drugs that they abuse to gain courage.

Substance Abuse
Substance abuse, particularly glue sniffing, is widespread amongst street children and is often engaged in as a way of reducing hunger pangs, keeping out the cold and dulling the senses against pain. Motala and Smith (2003) commented that with these 'benefits', however, the inhalation of solvent fumes also has numerous detrimental physical and psychological health impacts, from cognitive effects, which impair educational development to temporary or permanent paralysis. Children living in the streets abuse drugs to gain courage to do illicit things that they do in the streets. They sell drugs to earn some money to buy food and clothing for themselves. Makope (2006) states that some street children besides abusing drugs, get involved in petty crimes like selling drugs and engaging commercial sex to earn a living.

As a result of misuse of various drugs street children get hungry and would want to eat some food and in turn resort to scavenging in bins or begging for food from the streets.

Scavenging/Begging
Makope (2006) argued that the principal reason why street children are in the streets is to find food and shelter. These street children get food from dirty bins or from scavenging through dirty food that has been discarded. (Makope 2006). Ruparanganda (2008) observed that the street children also prepare their own food in the morning when they fail to get enough food from food outlets. According to Ruparanganda (2008) street children have a spirit of oneness, spirit of communalism whereby they put all the monies that they would have sourced for in the streets and buy food and eat together. Street children in Harare seem to know where the refuse bins for all places, the takeaways, supermarkets and restaurants are kept. They get their meals from scavenging in these bins.

Muchini (2001) states that besides begging the other economic activities undertaken by street children include vending, guarding cars, escorting blind parents, car-washing and taxi outing. UNICEF (2003) lamented that street children earn very little from these economic activities and they turn to criminal activities which results in them doing cat and mouse game with the police.

III. METHODOLOGY
This study used qualitative methodology. It employed the descriptive research design. This method was used as the researcher felt it was the most ideal for the study. The descriptive survey research designs are defined by their methodical collection of standardised information from any representative sample of the population (Christensen, 1994). In addition, this research design suits the context under which the present study was taken as the descriptive survey represents a probe into a given state of affairs that exists at a given time. It therefore means that direct contact was made with the individuals whose characteristics, behaviours and issues were relevant to the investigation under study. In this case the researchers had direct contact with the street children. It allowed the researcher to choose from a wide variety of instruments and in this research it was the interview schedule.

This research design has the advantage of the researcher being in direct contact with the research participants who were children living in the streets. The direct contact affords the researcher to be able to observe other information like non-verbal cues in the form of voice tone and facial expressions that quantitative techniques cannot capture. Data collected using descriptive survey method can be easily summarised and analysed.

This research design has the disadvantage of the researcher becoming carried away when carrying interviews. This occurs when a researcher encounters a case which touches ones heart a case likely to occur when working with street children. This problem was overcome by formulating questions in the interview schedule that were clear to the respondents so that answers required needed no much explanation.

Sampling involves selecting people from the population to represent the entire population, (Polit 2001). Purposive sampling was utilized in this study and the best available people provided rich data on the research questions. Polit (2001) describes purposive sampling as selecting participants with a broad general knowledge on the topic or those who have undergone the experience. The researcher selected ten (10) street children who
resided or operated from the streets of Harare Central Business District. The participants were selected on the basis that they had had contact with law enforcement agencies in one way or another. This could have been by having been rounded up or having been arrested.

The data was collected through the use of a semi-structured interview. McNamara (1999) states that in an interview the interviewer can control the response situation scheduling with the participation of the respondents to be mutually agreeable in time, place and the controlling of the question pace and sequence to suit the circumstances of the situation. Interviews are adaptable and help in creating trust and good rapport with the respondents. Interviews also allow the researcher to probe further there is feeling that the respondent has not given an adequate answer or there is need to explore an issue more deeply. In order not to disturb the flow of questions the data was recorded electronically. Few notes were taken to keep track of the interview.

IV. RESULTS

Activities engaged by street children in the street

The study solicited information on the activities of street children on the streets. The study depicted that forty percent of street children are engaged in vending.

Excerpt 1
“I get money for food from vending. I sell cigarettes and sweets in the street.”

Excerpt 2
“I am a vendor. I sell cell phone chargers and iced water on behalf of my employer. I am paid on commission”.

Excerpt 3
“I get money from selling mbanje in the street. Sometimes when I do not get any money I sniff glue to quench the hunger. I feel as if I am full after sniffing glue.”

Most of the children survived on selling sweets and cigarettes. Thirty percent of the respondents survived on begging. These children said they beg for money from motorists at street intersections.

Excerpt 4
“I get money from well wishers. I beg at robots and intersections. Some give coins while others give me food they will be eating. It is not much but at least I survive.”

Excerpt 5
“It is very hard to get places where people can give you money. I beg in restaurants and takeaways. There people are little bit generous”.

The study indicated that twenty percent of the respondents relied on the sell and abuse of drugs.

Excerpt 6
“Most people are selling sweets, cigarettes and eggs. It is better to diversify and look for products that are most sought after. My business of selling mbanje is lucrative. As long as people know I have the product they come and buy. But I have to be very careful so as not to be detected by police.”

Excerpt 7
“These days selling cigarettes is no longer profitable. Drugs is the way to go. You are assured of money.”

Some of the respondents said they survived on guarding and washing cars.

Excerpt 8
“I am not good at selling. So I depend on washing and guarding cars. At least I am assured of something at the end of the day.”

Twenty percent said they depended on scavenging. When they fail to get money through begging or vending they had no choice but to look for food in bins.

Excerpt 9
“These days things are difficult for everyone. If I do not get enough from begging there is nothing I can do besides going to look for food in bins”.

Only ten percent of the respondents said they survive on prostitution. Respondent number 3 said,

Excerpt 10
“I get money for food from my boyfriends. They ask for sex and in turn they pay me.”

The following table depicts the distribution of the activities of respondents on the streets.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Begging</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Scavenging</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Prostitution</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Wash / Guard Cars</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Vending</td>
<td>4</td>
<td>40</td>
</tr>
<tr>
<td>Selling Drugs</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>Abusing Drugs</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Theft</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Data obtained in the study revealed that forty percent of respondents survived on vending whilst thirty percent indicated that they engaged in begging. Twenty percent of the respondents indicated that they depended on scavenging, selling drugs and wash / guard cars. Only ten percent lived on prostitution, theft, and abuse of drugs.

V. DISCUSSION

This study revealed that forty percent of the children were involved in vending activities. The street children survived on selling various items ranging from sweets and cigarettes to fruits
and drugs. The money they got from these sales was so paltry to the extent that they lived from hand to mouth. It is during vending in the streets that they encountered law enforcement agents who made sure that they were driven off the streets. The municipal police have a department that is mandated to make sure all vending is done on designated sites. These are sites where proper ablution facilities have been put and people pay rates to the City Council. Street children move around selling sweets and cigarettes. They do not contribute anything to the City Council and perform their activities at undesignated places like entrances of supermarkets, bottle stores and bus stops. Their activities disturb the owners of supermarkets who will have paid rates and make contributions to the fiscus.

The study exposed that thirty percent of the children survived on begging from the intersections in the city centre. Begging at street intersections left the children vulnerable to being hit by motorists. These findings are similar to those found in a study by Muchini (2001) which indicated that the street children passed through some stages of begging, “First the child must present a pitiful sight; second, the child engages eye contact with the prospect; thirdly, the child persistently follows the prospect down the street. Finally, the child accepts whatever money is given, however small.” This practice annoys residents who call for the street children to be removed from the streets as they annoy them. When the street children fail to get something they usually become angry and leave scolding the person who will have failed to part with some money.

This study showed that twenty percent of the respondents earned a living from scavenging, selling drugs, washing and guarding cars respectively. Some of the respondents said they had no option but had to resort to scavenging when they failed to raise money for food through other means like begging and vending. A study by Makope (2006) says these street children get food from dirty bins or from scavenging through dirty food that has been discarded. Ruparanganda (2008) was in agreement when he said, “Street children in Harare seem to know where the refuse bins for all places, the takeaways, supermarkets and restaurants are kept. They get their meals from scavenging in these bins.” When scavenging they usually leave the place with litter scattered everywhere. This affects the owners of the bins and local authority staff. They will then try to make sure the if possible the street children do not get access to the bins.

The study revealed that twenty percent dwell on selling drugs to earn a living. Some children even take these drugs in order to quell hunger pangs or the cold nights. When they take these drugs they do not feel the cold neither do they feel hungry. But in some cases these drugs make them feel drowsy and hungry thereby scavenging for food in bins. This was lamented by Makope (2006) when he says “Children living in the streets abuse drugs to gain courage to do illicit things that they do in the streets.” Of the interviewed children, some of them said they sell drugs like ‘mbanje’(marijuana) in the streets. They get a ready market from other street children or other members of the public. Such activities are illegal and attract the attention of law enforcement agencies.

The study showed that only ten percent survived on theft and prostitution. Some of the children are involved in petty thefts whereby they snatch bags from unsuspecting women and children. Some children even steal from shops and are arrested for shop lifting. A report in the Zimbabwe Herald of 8th May 2013, exposed that a number of complaints have been received from members of the public to the effect that they were being robbed and at times street children were assisting criminals in committing crimes in the city.

One of the respondents said she engages in sexual activities in order to obtain food. According to a study by Muchini (2000) some children turn to sex with their fellow street dwellers for comfort, protection and a sense of belonging. For others sex is a source of income and material support. There was a similarity with other researches because of the difficult circumstances under which these children survived. The economic situation that prevailed during the study was the same as that of other researches.

VI. CONCLUSIONS

- The findings of the study revealed that street children beg in the streets for survival. They sell drugs and also abuse those drugs. The study discovered that street children engage in prostitution and vending to earn a living. Some street children earn money by washing and guarding cars. The street children are engaged in some activities that are illegal and some that disturb the ordinary people which then attract the attention of law enforcement agencies.

VII. RECOMMENDATIONS

- It is further recommended that the Government put in place programmes which look and promote the welfare of children living in the streets.
- It is also recommended that any violation of the rights of children living in the streets be brought to book and perpetrators prosecuted.
- The street children need to be equipped so that they earn their living by doing activities that are legal.

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Measurement and Determinants of Urban Poverty in Case of Southern Nations, Nationalities, and Peoples’ Region (SNNPR), Ethiopia

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Abstract - This study used survey data collected by Southern nations, nationalities and peoples’ region (SNNPR) bureau of finance and economic development (BoFED) in collaboration with Arba Minch University for 5,015 urban households. The major purposes of the paper are measuring urban poverty and identifying the determinants via employing logistic regression. Accordingly, for the year 2015 poverty incidence, gap and severity were equal to 18.02%, 5.25% and 2.31% respectively for the urban SNNPR. Urban food poverty measured using the above indexes leaves relatively larger figures. In the last five years the region’s urban poverty reduces remarkably except for food poverty severity which rose by 17.24%. The use of logistic regression to identify the determinants of urban poverty end up with marital status, family size, total dependency, education level, saving habit, and source of energy were found to be statistically significant variables. Hence, pre and post marriage orientations to reduce divorce and input support for windowed, limiting family size and in turn dependency using short and long term solutions, and supplying social and physical infrastructure such as education, financial institutions and power are viable options to reduce urban poverty in the region. The task of tackling urban poverty in the region should prioritize Wolaita and South Omo zones (districts) since both of them are characterized by higher incidence, gap and severity of poverty.

Index Terms- urban poverty, determinants of urban poverty, FGT indexes

I. INTRODUCTION

Ethiopian urbanization rate (16%) is lower than the sub-Saharan average of 30%. However, recently due to high rural-urban migrations and population growth of nearly 3.8%, remarkable urban expansions are observed. If managed proactively, the expansion of urban areas presents a huge opportunity to shift the structure and location of economic activity from rural agriculture to the larger and more diversified urban industrial and service sectors. However, poor management and planning in urban Ethiopia results in rising unemployment, challenges in the provision of infrastructures, services, and housing. Hence, low quality of life, low life expectancy, food shortages and high incidence of poverty characterize most of the urban areas (WB, 2015).

The multi-dimensional character of poverty in Ethiopia is reflected in many respects, such as destitution of assets, vulnerability and human development. The government has understood the multi-dimensional impacts of poverty and put poverty alleviation and reduction as major socio-economic and political issue in the country. The existence of large number of poor people and the prevalence of economic inequality may bring about social tensions which would induce various criminal acts if situations go beyond the limits of social tolerance. Poverty alleviation would, therefore, enhance economic development and result in improved incomes and better well-being of the people which is a pre-requisite for peace and further development (Asmamaw E. 2004).

According to Ministry of finance and economic development of Ethiopia (MoFED, 2012), southern nations, nationalities and peoples’ region (SNNPR) has the third largest urban poverty incidence of 25.8% next to Amhara and Gambella regions. With an estimated of nearly 2.5 million urban population in the region (CSA, 2010), the above figure leaves more than half a million of the region’s urban population trapped in absolute poverty. Moreover, though the incidence of rural poverty in the region (30.7%) is higher than the urban, the region owns the second minimum rural poverty next to Harari (10.5%) which relatively puts the region in better rank as far as rural poverty is concerned.

The relatively higher incidence of urban poverty in the region requires identification of the major causes of poverty, highly poverty stricken part of the population and where actually most of the urban poor located in. Doing so will ease the task of policy makers and development partners of the country to efficiently target poor urban households using the appropriate mode of interventions.

II. LITERATURE REVIEW

2.1 Theoretical literature

Theories of poverty

There are a number of compelling theories of poverty which frequently caught the attention of researchers when a need arise to anchor the causes of poverty on theories. Human capital theories of poverty developed by Becker (1975) and Mincer (1974) explains both individuals’ decisions to invest in human capital (education and training) and the pattern of individuals’ lifetime earnings, and their different levels of investment in education and training determine the fate of an individual either to be poor or non-poor. This theory also explains why the minorities within the society such as women among others have higher incidence of poverty due to lower earnings from labor market which in turn caused by low investment in human capital.
But, this theory is too shallow to explain the causes of poverty since earnings are one of the determinants of poverty (Tasew W. et al 2013).

The other dominant theory tried to relate the causes of poverty on the basis of geographical disparities. This theory explains why poverty is most intense in certain areas and why some regions lack the economic base to compete. More specifically, remoteness, lack of certain types of natural resource endowments, political disadvantageousness, and weak integration can all contribute to the creation of intra-country spatial poverty traps (Morrill and Wohlenberg, 1971).

David Elesh (1970) discussed two categories of theories of poverty to hit the score regarding the causes of poverty (i.e. cultural and structural). Cultural theories find the explanation for poverty in the traits of the poor themselves. These theories assert it is the valutational, attitudinal, and behavioral patterns of the poor which prevent them from being socially mobile. In contrast, structural theories explain poverty in terms of the conditions under which the poor live: unemployment, underemployment, poor education, and poor health…etc. The distinctive traits of the poor so central to the explanation of the cultural theorists are, for the structural theorists, responses or adaptations to the hostility of the structural conditions the poor face.

The frame of reference for both theories extends across national, cultural, ethnic, racial, and other boundaries. But both cultural and structural theorists have recognized, explicitly or implicitly, that there are certain societal characteristics necessary to the development of the poverty syndrome.

Such characteristics are high under- and unemployment for unskilled labor, low wages, little social organization among the poor, a bilateral kinship system, a value system stressing the individual accumulation of wealth.

Since poverty is multifaceted and multidimensional, it is worthy to construct model of poverty determination taking in to account various causes of poverty mentioned in theories and identify the significant causes for a specific area.

2.2 Empirical Literature

A study by Esubalew A. (2006) on the determinants of urban poverty in one of the town of Amhara region, Debre Markos, found that average monthly income, family size, educational level and disease incidence as significant determinants of urban poverty. With the dynamic behavior of causes of poverty from time to time, designing policies on the basis of a research done before 10 years and in other region may not be plausible.

Tesfaye A. (2006) decomposed urban poverty in Ethiopia to growth and inequality effects and found that both growth and redistribution are useful instruments in combating poverty. Though this study is crucial regarding the general impact of growth and redistribution on poverty, the war on poverty should have to go beyond this horizon and target specific causes.

Using a panel data Yonas A. et al (2012) analyzed the correlates of subjective and ordinary poverty in urban Ethiopia with the main emphasis on individuals’ perception of poverty on themselves. They found that households with a history of past poverty continue to perceive themselves as poor even if their material consumption improves.

The researcher believes since this paper will examine the determinants of urban poverty in the case study area via inclusion of wide range of variables and a survey data of 5,015 households collected from sample urban areas from the region, it will give a room for policy makers and development partners of the country to intervene in many aspects based on reliable findings to reduce urban poverty in the region.

III. METHODOLOGY

3.1 Description of the study area

Southern Nations, Nationalities and People’s Regional (SNNPR) states is located in South and South-Western part of Ethiopia. The total area of the region is 110,931.9sq KM and accounts nearly 10% of the country’s land mass. It has an estimated 18.395 million population and 3.774 million of households (CSA, 2014). On the basis of ethnic and linguistic identities, the region is at present divided to 14 Zones, 4 special woredas and 1 city administration which in turn contains 3,678 rural and 238 urban kebeles. Rainfalls vary from 400mm to 2200mm and mean annual temperatures swings between 10°C to 27°C (BoFED, 2015).

3.2 Sampling design

The survey covered rural and urban areas of the regional state. For the purpose of representative sample selection, the region was divided into two broad categories, i.e., rural and urban areas. Therefore, each category in the region was considered to be a survey domain.

The 135 Woreda towns, 22 reform towns, 4 special woreda towns and 1 city administration in the region were considered as urban clusters. Of these, a total of 26 Woreda towns and 1 city administration were considered as representative sample for urban cluster. A total of 57 urban kebeles were selected randomly. The respondents from each kebele were selected from the fresh list of households prepared at the beginning of the survey using systematic sampling techniques.

3.3 Sample Size Determination

Sample size of the study was determined using Cochran (1977)

\[ n = \frac{Z^2 \times pq}{(\varepsilon)^2} \]

Where \( Z_{0.025} \) = the two tailed critical value at 99 percent confidence interval (2.91).

\( p \) = probability of being poor in the region=0.3 (MoFED, 2012) 
\( q \) = probability of being non-poor in the region = 0.7 
\( \varepsilon \) = marginal error between sample and population value of poverty = 0.01

\[ n = \frac{Z^2 \times pq}{(\varepsilon)^2} = \frac{2.91^2(0.21)}{(0.01)^2} = 17,783 \]
The determined sample size was proportionately distributed to 41 rural, 26 urban woredas and 1 city administration in the region on the basis of their respective household sizes which leaves a sample size of 5,015 urban households to be taken for the survey.

3.4 Poverty measurement

Consumption as an indicator of welfare and cost of basic need approach (CBN) to fix poverty line is used in this paper. According to Jonathan and Shahidur (2009) consumption rather than income is viewed as the preferred welfare indicator for the following reasons since consumption better captures the long-run welfare level than current income; it may better reflect households’ ability to meet basic needs; it reflects the actual standard of living (welfare); it is better measured than income; income is likely to be understated than consumption expenditure; income is so erratic and seasonal that it may be very difficult for respondents to recall.

The most widely used method of estimating poverty line is the cost of basic needs method (WB, 2005) because the indicator will be more representative and the threshold will be consistent with real expenditure across time, space and groups. According to this approach, first the food poverty line is defined by choosing a bundle of food typically consumed by the poor. The quantity of the bundle of food is determined in such a way that the bundle supplies the predetermined level of minimum caloric requirement. It is at least 2,200 KCa intakes per day that will leave an individual not to be poor (MoFED, 2012). The bundle that gives 2,200KCa is valued at regional average prices to get a consistent poverty line across the region. Then a specific allowance for the non-food goods and services consistent with the spending of the poor is added to the food poverty line.

3.5 Poverty Indexes

Kimalu et al., (2002) pointed out that one poverty measure that has been found manageable in presenting information on the poor in an operationally convenient manner is the FGT (Foster, Greer and Thorbecke) measure developed by Foster et al., (1984). This measure is used to quantify the three well-known elements of poverty: the level, depth and severity (also known, respectively as incidence, inequality and intensity) of poverty.

Mathematically

$$P_a = \frac{1}{N} \sum_{i=1}^{n} \left(\frac{Z_i - y_i}{Z_i} \right)^{\alpha}$$

Where \(\alpha\) takes values of 0 (poverty incidence), 1 (poverty gap) and 2 (severity of poverty). \(N\) stands for total sample size and \(n\) for poor households. Poverty indexes are solved using Distributive Analysis/Analysis Distributive (DAD) software which is mainly designed for poverty and inequality analysis. Moreover, the software allows survey data to be weighted easily in case of oversampling of small populations and under sampling of large populations which are identified as common problems related to collection of survey data (WB, 2005).

3.6 Logistic Model Specification

Logistic regression is used to analyze relationships between a dichotomous dependent variable and independent variables of any form. Logistic regression combines the independent variables to estimate the probability that a particular event will occur, in this case the probability of the household falling below the poverty line or not.

Following Gujarati (2004) the probabilistic distributive function (PDF) of a household falling below the poverty line, \(P(Y_i=1)\) is given by

$$P(Y_i = 1) = \frac{e^{y_i}}{1+e^{y_i}}$$

To proceed further, we need the probability of the household not falling below the poverty line, i.e. \(P(Y_i = 0)\) and it is given by

$$P(Y_i = 0) = \frac{1}{1+e^{y_i}}$$

When the ratio of equation 2 to 3 is calculated (the probability of an event occurring to the probability of non-occurring), we get the odds ratio

$$\frac{P(Y_i = 1)}{P(Y_i = 0)} = \frac{e^{y_i}}{1+e^{y_i}} = e^{y_i}$$

The logit equation can be obtained via taking the natural log of equation 4.

$$\ln(e^{y_i}) = Y_i = B_iX_i$$

Where \(B_i\) and \(X_i\) are set of parameters and explanatory variables respectively.

IV. RESULTS AND DISCUSSION

4.1 Measuring and characterizing urban poverty in the region

A. Poverty lines and FGT Indexes of urban poverty in the region

The use of cost of basic need approach (CBN) to calculate the poverty line for the urban SNNPR results in Birr 4,230.10 and Birr 2,694.33 for total and food poverty lines respectively. More specifically, an urban household is classified as poor if his/her consumption expenditure for food and non-food is below Br. 4,230.10 and food-poor if expenditure on food is below Br. 2,694.33. FGT indexes are calculated and presented in the following table using the poverty lines already specified.

1 For the detail, you can infer Ravallion and Bidani (1994).

2 At time of data collection, the official exchange rate was 20.5Birr/1USD.
Table 1: Poverty incidence, gap and severity indexes for urban SNNPR in 2015

<table>
<thead>
<tr>
<th>Item</th>
<th>Head count index</th>
<th>Poverty gap index</th>
<th>poverty index</th>
<th>severity index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban total (food+non-food) poverty</td>
<td>0.1802</td>
<td>0.0525</td>
<td>0.0231</td>
<td></td>
</tr>
<tr>
<td>Food poverty</td>
<td>0.1979</td>
<td>0.0665</td>
<td>0.0340</td>
<td></td>
</tr>
</tbody>
</table>

Source: Own calculation using SNNPR’s BoFED Survey, 2015

For the year 2015, the proportion of urban population in the region who didn’t expend to the level that matched with 2,200 KCa is equal to 18.02%. For the same period, the incidence of urban food poverty is a bit higher (19.65%) than the overall incidence of poverty that accounts for both food and non-food expenditures.

MoFED (2012) used a survey data collected in 2010/11 and estimated urban poverty incidence for the region and it was equal to 25.7%. With this figure, urban poverty incidence in the region has declined by 29.88% in the last five years which can be considered as a massive achievement in light of existing socio-economic context and resource availability especially capital. The total urban poverty gap (5.25%) and severity (2.31%) are smaller than the food poverty gap (6.52%) and severity (3.31%) respectively. This entails that poverty incidence gap and severity are more pronounced in food than non-food consumptions. Though poverty incidence and gap have declined in the last five years by 26.97% and 8.9% respectively, food poverty severity which typical measures food consumption variations among the poor increased by 17.24%.

High inflation, lack of resources and pro-poor interventions (like urban safety nets...etc) may be mentioned as a potential reasons for rising urban poverty severity in the region.

B. Relative contribution to urban poverty severity: quintile presentation

For the first quintile (the poorest from the poor), poverty severity stood at 0.21 and this totally accounts nearly 61.56% of the total urban poverty severity. This quintile contribution is so high that the poorest from the poor are expending a meager portion of the poverty line. The value for this quintile is even higher if the poverty severity is referred only for food. Moreover, if the poorest 40% are identified and lifted from poverty, severity of total urban and food poverty will reduce by 85.59% and 85.28% respectively.

Table 2: Decomposing urban severity of poverty: quintile presentation

<table>
<thead>
<tr>
<th>Cumulative percentage of poor households</th>
<th>Severity of poverty (food+non-food) for the respective quintile</th>
<th>Percentage contribution to severity of poverty</th>
<th>Severity of food poverty for the respective quintile</th>
<th>Percentage contribution to food severity of poverty</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>0.205</td>
<td>61.56</td>
<td>0.276</td>
<td>61.538</td>
</tr>
<tr>
<td>40</td>
<td>0.080</td>
<td>24.02</td>
<td>0.1065</td>
<td>23.746</td>
</tr>
<tr>
<td>60</td>
<td>0.035</td>
<td>10.51</td>
<td>0.0485</td>
<td>10.814</td>
</tr>
<tr>
<td>80</td>
<td>0.012</td>
<td>3.45</td>
<td>0.016</td>
<td>3.456</td>
</tr>
<tr>
<td>100</td>
<td>0.002</td>
<td>0.45</td>
<td>0.002</td>
<td>0.446</td>
</tr>
</tbody>
</table>

Source: Own calculation using SNNPR’s BoFED Survey, 2015

For both total and food severity of poverty in the urban SNNPR, the relative contribution in percentage terms dramatically reduces when the level of quintile increases and finally hit to 0.4% for the fifth quintile (the richest among the poor) which is significantly low. The implication is that those households around the poverty line are so close to it and eases the task of lifting them from poverty if small efforts are exerts to this end.

C. Where are most of the urban poor located in?

In order to target the poor, it is important to know where urban poverty incidence, gap and severity are high in the region. Moreover, among the advantages of the FGT poverty index is its decomposability which makes it possible to investigate poverty in more detail.

The use of a common urban poverty line of Br. 4,230.10 end up with the following FGT indexes in each of the zones, special Woredas and city administration found in the region.
Table 3: Urban poverty in various zones, special Woredas and city administration of SNNPR

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Zone/Sp. Woreda/City adm.</th>
<th>Poverty Incidence</th>
<th>Poverty Gap</th>
<th>Poverty Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gurage Zone</td>
<td>17.83</td>
<td>4.9</td>
<td>1.96</td>
</tr>
<tr>
<td>2</td>
<td>Hadiya Zone</td>
<td>8.7</td>
<td>2.17</td>
<td>0.7</td>
</tr>
<tr>
<td>3</td>
<td>Kembata T. Zone</td>
<td>29.3</td>
<td>8.28</td>
<td>3.22</td>
</tr>
<tr>
<td>4</td>
<td>Sidama Zone</td>
<td>15.18</td>
<td>3.66</td>
<td>1.34</td>
</tr>
<tr>
<td>5</td>
<td>Gedeo Zone</td>
<td>0.084</td>
<td>1.91</td>
<td>0.7</td>
</tr>
<tr>
<td>6</td>
<td>Wolaita Zone</td>
<td>37.55</td>
<td>13.34</td>
<td>6.66</td>
</tr>
<tr>
<td>7</td>
<td>South Omo Zone</td>
<td>35.84</td>
<td>15.73</td>
<td>9.4</td>
</tr>
<tr>
<td>8</td>
<td>Sheka Zone</td>
<td>11.29</td>
<td>1.28</td>
<td>0.3</td>
</tr>
<tr>
<td>9</td>
<td>Kafa Zone</td>
<td>14.98</td>
<td>4.5</td>
<td>1.8</td>
</tr>
<tr>
<td>10</td>
<td>Gamo Gofa Zone</td>
<td>16.27</td>
<td>3.51</td>
<td>1.4</td>
</tr>
<tr>
<td>11</td>
<td>Bench Maji Zone</td>
<td>20.81</td>
<td>6.5</td>
<td>3.2</td>
</tr>
<tr>
<td>12</td>
<td>Segen Area P. Zone</td>
<td>28.81</td>
<td>8.5</td>
<td>3.35</td>
</tr>
<tr>
<td>13</td>
<td>Dawro Zone</td>
<td>7.3</td>
<td>2.11</td>
<td>0.8</td>
</tr>
<tr>
<td>14</td>
<td>Silte Zone</td>
<td>15.17</td>
<td>2.89</td>
<td>0.7</td>
</tr>
<tr>
<td>15</td>
<td>Yem Sp. Woreda</td>
<td>28.57</td>
<td>8.58</td>
<td>3.5</td>
</tr>
<tr>
<td>16</td>
<td>Baskito sp. Woreda</td>
<td>28.13</td>
<td>8.11</td>
<td>3.3</td>
</tr>
<tr>
<td>17</td>
<td>Konta Sp. Woreda</td>
<td>8.33</td>
<td>2.22</td>
<td>0.8</td>
</tr>
<tr>
<td>18</td>
<td>Halaba Sp. Woreda</td>
<td>8.65</td>
<td>1.75</td>
<td>0.5</td>
</tr>
<tr>
<td>19</td>
<td>Hawassa City Adm.</td>
<td>18.01</td>
<td>5.55</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Source: Own calculation using SNNPR’s BoFED Survey, 2015

Wolaita zone, South Omo zone, Kembata Tembaro zone, Segen Area People zone, Yem special woreda, Baskito special woreda and Bench Maji zone have urban poverty incidence above the regional average of 18.02%. In terms of poverty gap and severity, all the above districts except Bench Maji zone, also surpass the regional averages of 6.52% and 3.31% respectively. As a result, it calls for researchers to work on why poverty is high in the aforementioned zones and special woredas since in this paper only those causes of urban poverty at regional level are emphasized. If a need further arises to prioritize targeting the highest poverty incidence, gap and severity, pro-poor programs and projects should immediately addresses South Omo and Wolaita zones.

4.2 Determinants of Urban Poverty in SNNPR: Econometrics Estimation

Researches in the past indicated variations in the forms and dimensions of poverty in categories such as rural-urban settings. While rural poverty is often marked by its connection with agriculture and land, urban poverty is said to be associated with heterogeneous economic and social factors/variables (Yassin, 1997).

Variables in literature that determine urban poverty such as sex and age of household head, marital status of household head, family size, total dependency, education level of household head, in- migration to existing family members, saving habit, health status of households, energy source, and home ownership are considered in this study.

In the following table, I have presented the description of the explanatory variables, the type of the variable (dummy or continuous) and the expected impact a specific variable has on poverty status of the household, which took value 0 and 1 if the household is non-poor and poor respectively.
Table 4: Description of explanatory variables in the logistic model

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Variable description</th>
<th>Variable representation in the model</th>
<th>Variable type</th>
<th>Values if the variable is dummy</th>
<th>Expected sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sex of the household head</td>
<td>Dsex</td>
<td>Dummy</td>
<td>0= male, 1= female</td>
<td>Negative</td>
</tr>
<tr>
<td>2</td>
<td>Age squared of the household head</td>
<td>Agesq</td>
<td>Continuous</td>
<td></td>
<td>Negative/positive</td>
</tr>
<tr>
<td>3</td>
<td>Marital status of the household head</td>
<td>Dmart0</td>
<td>Dummy</td>
<td>1=single, 0= married, divorced and widowed</td>
<td>Negative</td>
</tr>
<tr>
<td>4</td>
<td>Marital status of the household head</td>
<td>Dmart1</td>
<td>Dummy</td>
<td>1= divorced, widowed 0=married and single</td>
<td>Positive</td>
</tr>
<tr>
<td>5</td>
<td>Number of family size</td>
<td>Famsize</td>
<td>Continuous</td>
<td>positive</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Total number of dependants with in a household</td>
<td>Totdep</td>
<td>Continuous</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Presence of in-migrants</td>
<td>Dmig</td>
<td>Dummy</td>
<td>0= if there is no in migrant (a migrant joining the urban household), 1=if there is in-migrant</td>
<td>Negative/positive</td>
</tr>
<tr>
<td>8</td>
<td>Educational level of the household head</td>
<td>Edulevel</td>
<td>Continuous</td>
<td></td>
<td>Negative</td>
</tr>
<tr>
<td>9</td>
<td>Saving</td>
<td>Dsav</td>
<td>Dummy</td>
<td>0= non-savers, 1= savers</td>
<td>Negative</td>
</tr>
<tr>
<td>10</td>
<td>Health status</td>
<td>Dheal</td>
<td>Dummy</td>
<td>0= no ill member, 1= ill member</td>
<td>Positive</td>
</tr>
<tr>
<td>11</td>
<td>Power source</td>
<td>Dpower</td>
<td>Dummy</td>
<td>0= electricity used for cooking and lighting, 1=otherwise</td>
<td>Positive</td>
</tr>
<tr>
<td>12</td>
<td>Home ownership</td>
<td>Dhomeon</td>
<td>Dummy</td>
<td>1= rented, 0=otherwise</td>
<td>positive</td>
</tr>
</tbody>
</table>
From these variables the coefficients for marital status, family size, total dependency, education, saving habit, and source of energy were found to be statistically significant.

### Table 5: Marginal effects after logit for analyzing urban poverty in SNNPR

<table>
<thead>
<tr>
<th>Variable</th>
<th>Marginal effects (dy/dx)</th>
<th>std.Err</th>
<th>Z</th>
<th>P &gt;</th>
<th>Z1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>0.0125914</td>
<td>0.01751</td>
<td>0.72</td>
<td>0.472</td>
<td></td>
</tr>
<tr>
<td>Agesq</td>
<td>9.49E-07</td>
<td>0.00000</td>
<td>0.23</td>
<td>0.819</td>
<td></td>
</tr>
<tr>
<td>dmart0</td>
<td>-0.0346192</td>
<td>0.01955</td>
<td>-1.77</td>
<td>0.077*</td>
<td></td>
</tr>
<tr>
<td>dmart1</td>
<td>0.0534554</td>
<td>0.02546</td>
<td>2.1</td>
<td>0.036**</td>
<td></td>
</tr>
<tr>
<td>Famsize</td>
<td>0.0080417</td>
<td>0.00394</td>
<td>2.04</td>
<td>0.041**</td>
<td></td>
</tr>
<tr>
<td>Totaldep</td>
<td>0.0322051</td>
<td>0.00478</td>
<td>6.73</td>
<td>0.000***</td>
<td></td>
</tr>
<tr>
<td>Edlevel</td>
<td>-0.0090191</td>
<td>0.00103</td>
<td>-8.78</td>
<td>0.000***</td>
<td></td>
</tr>
<tr>
<td>Dmig</td>
<td>0.0138462</td>
<td>0.01716</td>
<td>0.81</td>
<td>0.42</td>
<td></td>
</tr>
<tr>
<td>Dsav</td>
<td>-0.0930372</td>
<td>0.01198</td>
<td>-7.77</td>
<td>0.000***</td>
<td></td>
</tr>
<tr>
<td>Dheal</td>
<td>0.0101317</td>
<td>0.01154</td>
<td>0.88</td>
<td>0.380</td>
<td></td>
</tr>
<tr>
<td>Dpower</td>
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<td>1.05</td>
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</tr>
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</table>

***, **, * significant at 1%, 5% and 10% degree of precision respectively

<table>
<thead>
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<td>Hosmer-Lemeshow test for goodness of fit</td>
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<tr>
<td>LR chi2(12)</td>
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</tr>
<tr>
<td>Prob &gt; chi2</td>
<td>0.0000</td>
</tr>
<tr>
<td>Pseudo R2</td>
<td>0.1133</td>
</tr>
</tbody>
</table>

Marital status

Marital status of the household head has economic implication on household’s income level. Some literatures recommend that single headed households have high probability to escape from poverty than married. The assumption is that households headed by married individuals are supposed to be larger in family size. Large families in developed countries mean large labor force which in turn reduces the incidence of poverty. But in developing countries the reverse in most cases holds true in that larger households are associated with high incidence of poverty because many of the labor force are unemployed (Esuabieh A., 2006). The marital status (single) is statistically significant at 10 percent precision level. If the household head is single, the probability of this household falling in to poverty reduces by 3.46 percent compared to married, divorced and widowed households keeping other factors constant.

Marital status (divorced or widowed) of the household head is statistically significant at 5 percent level. Results from regression indicates that if the household is headed by divorced or widowed, the probability of falling in to poverty increases by 5.34 percent compared to household headed by married and singles. Household that headed by divorced man/woman divides resources into two and limits the household economic and social efforts from maximizing their welfare status. On other side, household headed by widowed man/woman potentially may lose the active labor force which significantly contributes to the household income and consumption.

Family size

The number of employed persons per household is often to be a good gauge of poverty. It is hypothesized that households with larger size have more probability of being falling into the poor category than those with lesser family size in developing country. As family size increases by one member, the probability of households falling into poverty increases by 0.80 percent.
Total number of dependants

The coefficient of total dependency is found to be positive and statistically significant at 1% level of precision. If one dependent person added in the household, the probability of household falling in to poverty increases by 3.22 percent. For large dependency, economically active population takes burden of supporting the large dependent group of population which substantially reduces the individual’s income and consumption shares.

Education

The coefficient for education of the household head is found to be negative and statistically significant at 1 percent precision level. Citrus paribus, if schooling level of the head of household increases by one grade, the probability of household falling into poverty reduces by 0.80 percent. This is not a surprising result since a voluminous literature in both developed and developing countries documents the relationship between the lack of education and poverty. Educated laborers have opportunities to get employment with good income, conduct businesses and any economic activities based on knowledge that are profitable enough.

Saving

Results of logistic regression in this study revealed that the coefficient for saving is found to be negative and significant at 1 percent precision level and implies that being a saver reduces the probability of falling in to poverty by 9.30 percent compared to non-savers keeping other factors constant. Households with practice of saving and credit utilization have better chance to escape from poverty because they have good ground to invest on profitable businesses and coping short term market shocks.

Source of energy

Results of logistic regression revealed that the coefficient for the variable is found to be positive and statistically significant at 1 percent level. If the household doesn’t use electricity for lighting and cooking, the probability of such household falling into poverty increases by 8.20 percent relative to households having alternative energy source (electricity). Urban households especially students and females collect fire wood for lighting and cooking purpose. The situation will have an impact on effectiveness of students and environmental sustainability in addition to lose of economic time that reduces productivity.

V. RECOMMENDATIONS

The importance of pre and post marriage orientation is important to reduce the rate of divorce since poverty is high among these households. With regard to windowed, capacitating them via supplying resources at subsidy (eg: credit with lower interest rate) and training will help them to compensate the loss of active labor force from the household.

Since both larger family size and number of dependants cause households to be poorer, short term solutions such as use of family planning, reducing early marriage and long term solution of educating female should catch the attention of policy makers and development partners.

Education creates an opportunity to get formal sector employment, healthily children…etc. But there is a debate about the level of education that should be given so that it better hits poverty. If we are working with more capital constraints to deliver all levels of education desired by the society, it is better to opt for primary and adult education since they maximize the net return from societal point of view (Todaro, 2011). Interventions targeting to reduce direct and indirect costs of education and increasing accessibility of this service call for determined participation of not only government but also communities and NGOs.

The expansion of financial institutions, awareness creation, incentives should guide financial institutions’ activity in order to increase the number of savers and amount of saving. The current remarkable effort of electrification should be further intensified and reliable in its supply since poverty reduces more due to use of it for both cooking and lighting.

The very urban poor have to be identified rigorously and supported by pro-poor projects and programs such as urban safety nets, subsidized food items...etc. Moreover, since education is commonly recommended as a plausible option to reduce inequality, the direct and indirect costs of it should be systematically reduced for the very poor via supporting education materials, financing cost of uniforms, providing assets to the family, school feeding…etc. Doing so will increase participation and reduce drop out from the school among the very poor.

Last but not least, the task of tackling urban poverty in the region should prioritize Wolaita and South Omo zones since both of them are characterized by higher incidence, gap and severity of poverty.

ACKNOWLEDGMENTS

The researcher is very keen to thank Dr. Tora Abebe, Dr. Rahmato Negash, Mr. Defaru Debebe, Mr. Sileshi Mengistu, and Mr. Eshetu Ewunetu., all staffs from Arba Minch University, for their unreserved professional support at various stages of this paper. Moreover, I want to extend my gratitude to SNNPR finance and economic development bureau for financing the data collection of this survey and there of activities in which this paper is one of their fruits.

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The Perspectives of Social Studies Continuity Issues in Kenyan System of Education: A Case of Nakuru County

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Abstract- Continuity of a subject is looked at in terms of the vertical and horizontal relationship in the curriculum (relationship between and within content and the subject being taught from one level to the next). In Kenyan scenario integrated Social Studies (SST) is only taught in primary schools and in teacher training college. This research study sought to find out how continuity in Social Studies (SST) content can be made appropriate in relation to the changes in the contemporary society. The study also sought to find out the perception of teachers on the trends of continuity in Social Studies content in relation to the number of years one has taught. The findings indicate that the topics in SST becomes complex as learners progress from lower classes to the upper classes, and that SST content offers learners the opportunity to apply what they learnt in school in their daily life. Findings show that there’s significant difference between the perceptions of teachers on Trends of continuity in Social Studies in relation to the length of teaching Social Studies between teachers.

Index Terms- continuity, Social Studies, standard, Trends

I. INTRODUCTION

Continuity is involved in the vertical organization of curriculum and it ensures that ideas, themes and skills are dealt with more than once in a school curriculum Goodland and Su (as cited in Sowel, 2005). Since most children do not grasp given concept in one experience, several exposures to given concepts in Social Studies should be made building from simple to complex content from one level of teaching and learning to the next level.

The Status of Social Studies continuity worldwide is that it is taught at all levels of education. In America Social Studies is taught up to graduate programs in Universities like; Indiana university, Boston University, the University of Iowa among many others. In the United Kingdom (https://www.whatuni.com) More than 154 universities offer Social studies. In Africa, Nigeria for example Social Studies is taught up to the Doctorate level (Sofadekan 2012), In Ghana it is taught up to the university level, in Malawi Social Studies is taught up to university level and in Uganda from 2017 integrated Social Studies will be introduced in secondary schools although it is taught at the university level up to Doctorate level at Makerere University, Integrated Social Studies in Kenya is only taught in primary schools and in primary schools Teacher Training college (Thungu, Wandera, Gachie & Alumande, 2011). In Kenya, there is therefore need to think in the line of continuity of teaching and learning Social Studies at all levels of schooling up to university level and the Curriculum is reviewed.

Trends of Continuity in Social Studies

Looking at the continuity in teaching of Social Studies in Ghana, Eshun (2013) gives a short historical account and its continuity from a historical perspective. He shows that the introduction of Social Studies in Ghana was preceded by a follow up of Educational Conference of Mombasa in Winneba, Ghana, in 1969. This conference came after the African Social Studies Program (ASSP) had met in Kenya in 1968 to deliberate on issues to do with Social Studies (Shiundu & Omulando, 1992). During Winneba conference, Social Studies was adopted as part of the school curriculum in Ghana. It was first introduced in the Primary Schools in 1972, where it was called Social/Environmental Studies. Also in 1976, all Teacher-Training Colleges in Ghana were asked to start the preparation of Basic School teachers to handle Social Studies.

The above continued to be the situation until the new Educational Reforms of 1987. On the same footing in Nigeria, Sofadekan (2012) shows that Social Studies is now a distinct part of the curriculum at all levels of the Nigerian educational system. Many of the faculties of education in Nigerian universities now run post-graduate degree programmes leading to the award of the post-graduate Diploma in Education, Master’s Degrees and even Doctor of Philosophy degrees in Social Studies. This shows that there is continuity in teaching of Social Studies from primary schools and in Teacher Training Colleges in the Ghanaian and Nigerian society. This is not what happens in Kenyan system of education. Here, Social Studies is taught in primary schools and in Primary School Teacher Training Colleges only.

Eshun (2013) continues to show that in Ghana, Social Studies was introduced and confined to the Junior Secondary Schools (JSS), now Junior High School (JHS) which is an equivalent of ordinary level in the previous education in the Kenyan system of education and the Teacher Training institutions. The subject in the primary schools became known as Environmental Studies, now citizenship education which is taught at the upper primary school level in Ghana.

This means just like in Kenya, Social Studies has experienced different changes not only in terms of the name but also the content taught. In Kenya, it was initially called GHC combined course from 1985 before taking the name Social Studies in 2002. According to Shiundu and Omulando (1992) the sub evaluation of the Kenyan curriculum which include Social Studies included the 1990 formative evaluation reports, in 1995
there was a summative report and the 1999 national capital needs Assessment survey report which concluded that the curriculum among others did not address emerging issues like conflict and conflict resolution, HIV/AIDS and drug abuse. When the 2003 primary school syllabus was introduced in Kenya, emerging issues like conflict and conflict resolutions were included in Social Studies among other subjects.

Eshun (2013) further shows that in 1998 Social Studies was introduced in the Senior Secondary Schools (SSS), now Senior High School (SHS) an equivalent to the advanced level in the previous education in the Kenyan system of education to replace Life Skills.

The forgone observation completely deviates from Kenyan case where although the advanced (A) level was replaced by the current 8–4–4 system of education, Social Studies is only taught in Kenyan primary schools. In Ghana the aforementioned recommendation was done by the 1994 Educational Review Committee, which provided the basis for continuation of learning in the discipline from the JSS to the SSS level.

In 1999 the Kenya government initiated the Davy Koech commission of education (Koech, 1999). One of its recommendations was the introduction of Social Studies to replace GHC a combined course. However, the commission unlike that of Ghana did not recommend Social Studies to be taught in secondary schools and in colleges. If this can be done it can help in the continuity of the content taught in primary schools to be carried over to secondary schools and to the colleges and universities.

If Social Studies is not part of the curriculum from primary school all through to the university, the learners cannot be expected to be prepared to understand or participate effectively in an increasingly complex world. Social Studies is supposed to be geared towards attaining a balance between an individual and community needs. The current study found this as a gap which needs to be filled by recommending for continuity of teaching and learning of Social Studies at all levels of education in Kenya.

Eshun (2013, p. 17) asserts that, “teaching Social Studies is stressed to be done in student-centred techniques and strategies.” The authority, further stresses that brainstorming, role-playing, simulation, discussion and debate are the major techniques stressed by both colleges of education curriculum and the Junior High School (JHS) Social Studies syllabus in Ghana. This is a pointer to the fact that even in the process of teaching and learning of Social Studies, there are diverse methods of teaching which can be adapted as the content being taught dictates. In relation to this line of view, this work set out to find out whether Social Studies embraced different strategies of teaching. The recommendation were that there’s need to take teachers for in service training in Kenya in order to help them be abreast with the contemporary best practices in teaching and learning of Social Studies.

The above observation concurs with findings of Mwangi (2014) who conducted a research on the current status of Social Studies continuous assessment in Kirinyaga, Kenya. Her findings were that drawing from teachers and pupils perceptions, there were very many continuous assessments (CA) strategies used in Social Studies in Kenya. However, her findings showed that the strategies were not fully utilized due to lack of knowledge on application among Social Studies teachers. Further, she showed that CA plays an important role towards the pupils learning Social Studies. This is because through CA, Social Studies teachers tend to realize their weaknesses in teaching and those of their pupils’ and strive to restructure them. She also concluded that the contribution of CA should not only be looked at as improving pupil’s performance but also as determining pupils’ current level of knowledge, skills or understanding of Social Studies content. The results further showed that majority of the teachers were aware of the benefits of CA in learning Social Studies in their schools. Further on, Mwangi (2014) findings also show that some usefulness of Social Studies was not realized in Kenyan schools because CA was not established in such a way that it builds on all the foundations that were beneficial towards teaching and learning of Social Studies. This could be attributed to the quick changes in Social Studies content taught in Kenyan schools.

Eshun (2013) observes that teachers’ understanding of the subject matter and ability to share information with students comes from the foundations of knowledge they have gained. The knowledge base for teaching defines a set of knowledge necessary for one to be an effective teacher. The teacher should, therefore, have had exposure to Social Studies at various levels. This creates continuity in terms of the teacher preparation. This is not the case in the Kenyan setting. Social Studies is not taught in the secondary schools and at the universities.

In Moi University, those students who are taking Bachelor of Education in Early Childhood Development Education (ECDE) are taught Social Studies which is basic and skeletal in content in their first and second year of study. However, when they get to the third year they are supposed to take either Geography or History. The major problem emanates from the fact that there has been no continuity in Social Studies curriculum in Kenya. The lecturers themselves have not taken Social Studies as an integrated course and, therefore, their approach to Social Studies is in relation to the subject they studied at the university that is either Geography or History (Shiundu and Omulando 1992).

The challenge is still there even in Teachers Training Colleges because much as the student teachers are taught Social Studies, the lecturers here teach it in relation to what they specialized in at the university that is either Geography or History.

Continuity and evaluation

Continuity may also be conceived in relation to the two major types of evaluations namely formative evaluation and summative evaluation.

Formative evaluation; According to Ogula (2002), formative evaluation is conducted to provide data to improve the programme. Therefore, this informs the need to have formative evaluation of the Social Studies objectives, content and the whole process of implementation of the curriculum at all levels of education.

Summative evaluation; The main purpose of summative evaluation is to collect and present data needed for judgments about the value of the programme (Ogula, 2002). After the Social Studies curriculum has gone through its full cycle or when it is near completion, summative evaluation should be conducted.
to objectively assess the gains that have accrued as a result of it being taught.

One of the areas this research study was interested in is there is need to have continuity for teaching Social Studies content which is revised to stand the test of time in primary school, secondary school, teachers training colleges and universities with evaluation in mind hence continuity.

II. METHOD

This research study adopted a mixed research methods approach in order to provide an in-depth perspective on the issues touching on Social Studies. Creswell and Clark (2011) justify the use of mixed methods because the combination of qualitative and quantitative data provides a more complete understanding of the research problem than either approach by itself. Two hundred and fifty teachers of Social Studies were sampled using stratified random sampling method.

Questionnaires were used to gather information from the teachers while interview guide was used to gather in-depth information from the Quality and Standards Officers (QASO) and the chairpersons of Kenya Primary Schools Heads Association of Nakuru Sub-County, Kenya.

To ascertain the extent to which there was continuity of Social Studies, the responses were interpreted using the following criteria:

- 3.50-4.00 = High integration in Social Studies
- 2.50-3.49 = Moderate integration in Social Studies
- 1.50-2.49 = Low integration in Social Studies
- 1.00-1.49 = No integration in Social Studies

III. RESULTS AND DISCUSSIONS

This research study was guided by these research questions:
1. How should the trends of continuity in Social Studies content be made appropriate in relation to the changes in the contemporary society?

Trends of Continuity in Social Studies

Continuity is most evident in Bruner’s (as cited in Ornesteen & Hunkins, 2010) notion of “spiral curriculum.” His opinion has it that curriculum should be organized according to the interrelationships among the basic ideas and structures of each major discipline. He avers that for students to grasp these ideas and structures, they should be developed and redeveloped in a spiral fashion, in increasing depth and breath as pupils advance through the school program. This study sought to establish the extent of the teachers’ agreement and disagreements with issues touching on continuity.

<table>
<thead>
<tr>
<th>Table 1 Trends of Continuity in Social Studies (n=246)</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<tbody>
<tr>
<td>In my secondary school days I was taught Geography, History etc which form integrated SST separately</td>
<td>3.66</td>
<td>.500</td>
</tr>
<tr>
<td>In the primary school teacher training college I was taught Geography, History etc which form integrated SST separately</td>
<td>3.37</td>
<td>.775</td>
</tr>
<tr>
<td>Combined Social Studies curriculum is taught from primary schools, secondary schools, in colleges and universities</td>
<td>1.80</td>
<td>.695</td>
</tr>
<tr>
<td>The topics in SST becomes complex as learners progress from lower classes and the upper classes</td>
<td>3.53</td>
<td>.583</td>
</tr>
<tr>
<td>There are charts and maps of county, Kenya, Eastern Africa and Africa in my school</td>
<td>3.31</td>
<td>.653</td>
</tr>
<tr>
<td>SST content offers learners the opportunity to apply what they learnt in school in their daily life</td>
<td>3.20</td>
<td>.634</td>
</tr>
</tbody>
</table>

Trends of Continuity in Social Studies and Learning Individual Subjects that form Integrated Social Studies in Secondary Schools

The participants were asked to show the extent to which they agreed with the item which asked them if in their secondary school days they were taught Geography, History, etc., which form integrated Social Studies curriculum separately. The rated average of teachers to this item was found to be ($\mu=3.66$, $SD=.500$) which is strongly agreement zone.

Indeed it is clear from the above findings that a vast majority of the teachers who participated in this study were taught subjects which form Social Studies separately. This is the practice in Kenya and which should change because with the accelerating pace and scope of changes in the contemporary...
society, today’s Kenyan students cannot prepare for life by merely learning isolated facts. Tabo (as cited in Ormstein and Hunkins, 2010) noted that a curriculum that presents information only in bits and pieces prevents students from seeing knowledge as unified.

The traditional subjects like Geography, History and Civics inherited from colonial education system according to Mbabba and Omabe (2012) were criticized for not being relevant both in purpose and content to the immediate needs of the Nigerian society at large. The Kenyan society is not an exception to this criticism. One of the reasons for the adoption of Social Studies as set forth by the Mombasa Conference in 1968, was that the new subject is supposed to enable every school-going child in Africa to understand peoples’ interaction with their cultural, social and physical environment, appreciate home and heritage, develop skills and attitudes expected of citizens and learn to express ideas in many ways Meryfied and Mutebi (as cited in Edinyang & Ipuole, 2014).

This means, Kenyan curriculum is still wanting, especially in Secondary schools and in colleges where the subjects which form Social Studies are taught separately when looked at in relation to the reason outlined above. Therefore there is need for integrated Social Studies to be taught in secondary schools in order to prepare the students to be able to fit well as global citizens.

**Trends of Continuity in Social Studies at Teacher Colleges**

This research study set out to inquire the extent to which the teachers agree or disagree with the statement that in the Primary School Teacher Training College they were taught Geography, History etc which form integrated Social Studies separately. Findings in Table 1 show that the mean score of the participants to the statement was ($\mu=3.37, SD=.775$).

Initially teachers who went to Primary School Teacher Colleges were taught the individual subjects which form Social Studies separately. However later after the recommendation of the Koech Commission (1999) subjects taught at the Teacher Colleges were divided into two namely, option A and option B. Option B has Social Studies, Music, Art and Craft, Kiswahili and English (Thungu, Wandera, Gachie & Alumande, 2011). This informs the results above that there are those who went to Teacher Colleges and learnt the subjects separately while there are those who went to Teacher Colleges when integrated Social Studies was taught. This is a step towards the right direction.

Okam (2012) has argued that effective teaching of Social studies can only be realized by professionally trained Social Studies teachers, who have adequate instructional orientation to inculcate appropriate values, skills, knowledge and attitudes in the learner for transformative nation building. Effective teaching of Social Studies, therefore, entails qualitative teacher training and recruitment in Social Studies as an integrated subject. In other words effective teaching of Social Studies cannot be realized without sound trained teachers in methods of teaching Social Studies.

**Trends of Continuity in Social Studies at all Levels of Education**

The trends in many countries of the world from America, Britain, Ghana, Nigeria and more recently Uganda among many other countries offer integrated Social Studies from primary schools, secondary schools, Teacher Colleges and in the universities (Kissock as cited in Bekoe, 2013, Eshun, 2013 & Sofadekan, 2012). In Table 1 above there’s presentation on how the participants responded to item on whether the teaching of combined Social Studies is done from primary schools, secondary schools, Teacher colleges and universities. The rated average response to the item is ($\mu=1.80, SD=.695$) this is a disagreement area.

The practice in Kenya as attested to by the results above show that a vast majority of the respondents show that integrated Social Studies is not taught at all levels of education. This is a deviation from the trends that is taking shape worldwide. Interview results on the same issue above are also captured. One of the tutors from the primary school teacher college said that;

Yes I think integrated Social Studies should be taught in all levels from primary schools up to the university level. I have done integrated Social Studies at Moi University where elements from different disciplines are integrated and in my opinion it is quite helpful if it can be taught at all levels of education.

The above assertion was corroborated by the QASO who observed that;

Social Studies should be taught at all levels of education. Man is a social being and should be conversant with social dynamics at all levels of education.

On the same note of the need to teach integrated Social Studies at all levels of education in Kenya, one of the KEPSHA chairpersons said that;

Yes it should be taught up to form four but when one reaches the university level it should be handled separately to spur more mastery of the individual subjects.

Another KEPSHA chairperson differed and said that;

No integrated Social Studies can be taught up to form four level. At the university level, students should specialize in individual subjects.

The other tutor of the primary school teacher college was of a contrary opinion by asserting that;

In primary schools it is wise to encourage integrated Social Studies. However, in secondary schools, colleges and universities, individual components of Social Studies will be of much help and more effective. I trained in Geography at the university level and, therefore, I feel more comfortable handling content on Geography than integrated Social Studies.

From the discussion above it is important that Kenyan system of education should adapt teaching of integrated Social Studies at all levels of education. The teachers also need to be taught the importance of Social Studies at all levels of education.

**Trends of Continuity in Social Studies in Relation to Topics Complexity as Learners Progress from Lower Classes**

This study sought to find out whether there’s progression of topics from simple to complex topics as learners move to the next classes. The findings show that the mean score of the responses is ($\mu=3.53, SD=.583$) which is strongly agreement zone.

The above results show that the integrated Social Studies has made use of the psychological sieve to moderate the learning process of the pupils. The learners’ are supposed to be taught
from simple to complex content and from the known to unknown content (Sofadekan, 2012).

Kenya Institute of Education (2009), shows that the content becomes complex as learners move from lower classes to the next. When one focuses on the theme of living together, in standard one they learn about our home and school, in standard two it is school and neighbourhood, in standard three it is our district, in standard four it is our county/former Rift Valley region, in standard five they learn about Kenya, standard six it is about Eastern Africa, in standard seven it is about Africa and finally in standard eight it is about Kenya and the world. From the above examples of content taught in all classes it is clear that the content becomes complex as the learners progress from one class to the next. This means there is continuity and the complexity of content as learners move from one class to the next.

Trends of Continuity in Social Studies in Relation to Teaching Aids

As shown in the preceding discussion the content increases in complexity as the learners’ progress to the next class. This complexity should be accompanied with the teaching aids which vary in complexity. This research interrogated if there are charts in classes which show continuity of teaching and learning integrated Social Studies. Data was collected, analyzed and interpreted. The mean value to this item is (µ= 3.31, SD= .653) which is agreement zone.

Further, analysis of the item was done in relation to the type of school. Results were analyzed and presented in Table 2 below.

Findings in the table below show that sixty eight (68) teachers and fifty nine (59) teachers from public and private schools respectively agree with the statement that, there are charts and maps of county, Kenya, Eastern Africa and Africa in my school. Seventy one (71) teachers and twenty eight (28) teachers from public and private schools respectively strongly agree, six (6) teachers and eleven (11) teachers from public and private schools respectively disagree while only three (3) teachers from public schools disagree.

| Table 2 There are Charts and Maps of County, Kenya, Eastern Africa and Africa in my School. |
|-----------------------------------------|------|------|------|------|
| Which school type do you teach? | Type school of Public primary school | 3 | 6 | 68 |
| | Strongly Disagree | Disagree | Agree | Strongly Agree | Total |
| | | | | | |
| Private primary school | 0 | 11 | 59 | 28 | 98 |
| Total | 3 | 17 | 127 | 99 | 246 |

The majority of teachers who agreed shows that there is continuity in relation to teaching and learning by use of charts and maps which progress from the simplest unit of administration of home as taught in standard one to the world as taught in standard eight.

To make the teaching of Social Studies less cumbersome and realistic, Mezieobi, Nzokurum, and Mezieobi (2014) have suggested that instructional materials and community resources like charts and maps ought to be employed to clarify abstract concepts and difficult topics. The resources simplify teaching and learning for teachers and students. On the same breadth Ayuh (2008) argues that proper organization of materials (in Social Studies) classroom stimulates retention and by extension motivates learning. In other words the use of media resources including modelling of physical features and use of graphics adds value to learning, they motivate learning and save the teacher the excruciating pain of extreme explanations and analysis hence enhancing learning.

Trends of Continuity in Social Studies in Relation to Learners’ Application of What They Learnt in School in Their Daily Life

There are many areas through which learners need to apply the knowledge they gained in their daily lives at school and at home. Taylor (2008) shows that integrated Social Studies broaden the students’ knowledge of history and diverse culture. This helps the learners to appreciate people from different cultures hence leading to a peaceful co-existence in their lives.

This study sought to establish whether Social Studies content offers learners the opportunity to apply what they learnt in school in their daily life. Findings in the table 1 shows that the mean of the respondents in relation to the item statement that Social Studies content offers learners the opportunity to apply what they learnt in school in their daily life is (µ= 3.20, SD= .634).

The vast majority of respondents being in agreement zone that learners’ apply what they learnt Social Studies in their daily life, show that it can help the students to be responsible people in the society who promote democracy and human rights.

When the interviewees were probed on the areas where the learners apply the knowledge got from learning Social Studies, one of the KEPSHA chairpersons observed that;

Knowledge gained in Social Studies has helped our student governing council which was known initially as prefects to be willing and able to resolve disputes in and out of schools. This means that only serious cases reach the teachers.

On the same note another KEPSHA chairperson was of the opinion that;

Our learners are trained to be responsible adults who understand and promote awareness of democracy in the society when they become adults. In our schools today we don’t hand
pick the leaders for the pupils. We organize for a day when the learners vote for the candidates of their choice. The teachers act as the returning officers, the vying learners have their agents during voting and at the tallying centre in a given class. In my opinion, this practice will help to inculcate in the learners issues touching on transparency and accountability in voting.

Another KEPSHA chairperson observed that;

The learners are taught about map reading and interpretation in Social Studies. These skills help them when they grow up to interpret information and making right judgments on the directions to go especially when new in a place and they have the map of where they are going.

The above observations show that there is continuity of knowledge gained in Social Studies to the real life situation not only in school but even after schooling.

Eshun (2013) in his study observes that Social Studies helps students to understand their society better, helps them to investigate how their society functions and hence it assists them to be critical and at the same time develop the kind of mind that transforms societies. Eshun goes further to conclude that if students understand the Ghanaian better, and are able to examine the society’s institutions’ ways of life with a critical and constructive mind, the country will be on the path to better and faster growth and development. The above assertion is true about the Kenyan society.

Amuche and Mu’azu (2013) on the importance of Social Studies shows that some of the complex goals in Social Studies such as development of responsible citizenship may not be evident until after students have left school and engaged in tasks such as informed voting, social action and other forms of civic participation.

2. Is there a significant difference in the perception of teachers on the trends of continuity in Social Studies content according to the number of years one has taught?

In order to find out if there was observed difference in mean perception of teachers on trends of continuity in Social Studies content according to the number of years one has taught, data was analysed and presentation done in Table 3a, 3b, 3c and 3d. The following null hypothesis was tested.

$H_0$: There is no significant difference in the number of years one has taught and the perception on the trends of continuity in Social Studies content.

Table 3a  Trends of Continuity of Social Studies

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 years and below</td>
<td>104</td>
<td>3.1824</td>
<td>.39957</td>
<td>.03918</td>
</tr>
<tr>
<td>6 years-10 years</td>
<td>79</td>
<td>3.1831</td>
<td>.33341</td>
<td>.03751</td>
</tr>
<tr>
<td>above 10 years</td>
<td>63</td>
<td>3.0450</td>
<td>.38938</td>
<td>.04906</td>
</tr>
<tr>
<td>Total</td>
<td>246</td>
<td>3.1474</td>
<td>.38014</td>
<td>.02424</td>
</tr>
</tbody>
</table>

Table 3a shows that the teachers who have a teaching experience of 6 years – 10 years had a higher mean of ($\mu=3.1831$) those who have a teaching experience of 5 years and below had a mean of ($\mu=3.1824$) while those who have a teaching experience of above 10 years had a mean of ($\mu=3.0450$). As a result of this observed difference in mean perception of teachers, the researcher tested whether there is homogeneity of variances.

Table 3b Test of Homogeneity of Variances Trends of Continuity of Social Studies

<table>
<thead>
<tr>
<th>Levene Statistic</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.369</td>
<td>2</td>
<td>243</td>
<td>.096</td>
</tr>
</tbody>
</table>

Table 3b shows there is homogeneity of variance because the p value $0.096>0.05$. Therefore hypothesis 3 was tested at 0.05 level to determine if the observed mean difference was significant.

Table 3c Trends of Continuity of Social Studies

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.889</td>
<td>2</td>
<td>.444</td>
<td>3.129</td>
<td>.046</td>
</tr>
<tr>
<td>Within Groups</td>
<td>34.516</td>
<td>243</td>
<td>.142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>35.404</td>
<td>245</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The analysis of variance in Table 3c shows that there is significant difference on the teachers perception on the status of scope in relation to the teaching experience because the p value is .046 hence p<0.05 and the F value is 3.129. Therefore the null hypothesis was rejected. From the findings it can be deduced that the teaching experience play a critical role in influencing the teacher’s perception on status of continuity in Social Studies content.
The more the years one has taught, transforms into understanding the subject matter, issues touching on the continuity and its interrelatedness with Social Studies curriculum content. It can be explained that the vastness in terms of the years of teaching of the participants in this study brought about the differences in perception. This could also be seen in the light of a study by Rice (2010) who found out that there is positive influence of the early career experiences in this study, those below five years and those in late career experience are those above fifteen years.

Since the sig value is close to .05, in order to find the specific experiences which are significantly different a post hoc test was run with results as shown in Table 3d below.

### Table 3d Dependent Variable: Trends of continuity of Social Studies

<table>
<thead>
<tr>
<th>(I) Kindly indicate how long(J) Kindly indicate how long</th>
<th>you have been teaching Social</th>
<th>you have been teaching Social</th>
<th>Mean</th>
<th>Difference</th>
<th>Std. Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td>5 years and below</td>
<td>6 years-10 years</td>
<td>-.00075</td>
<td>.05625</td>
<td>.989</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>above 10 years</td>
<td>.13740</td>
<td>.06017</td>
<td>.023</td>
<td>.00075</td>
<td>.989</td>
</tr>
<tr>
<td></td>
<td>5 years and below</td>
<td>.13815*</td>
<td>.06366</td>
<td>.031</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 years-10 years</td>
<td>above 10 years</td>
<td>-.13740*</td>
<td>.06017</td>
<td>.023</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 years and below</td>
<td>-.13815*</td>
<td>.06366</td>
<td>.031</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6 years-10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Findings show that there’s significant difference between the perceptions of teachers on Trends of continuity of Social Studies in relation to the length of teaching Social Studies between teachers with an experience of 5 years and below and those with an experience above 10 years at p value = .023 hence p<0.05. there is also significant differences between those with an experience above 10 years and those with 6 – 10 years at p value = .031 hence p<0.05.

IV. SUMMARY

Looking at the trends of Continuity in Social Studies it is evident that in their secondary school days a vast majority of the participants were taught Geography, History etc which form integrated SST separately, in the primary school teacher colleges some participants depending with the year they were in college were taught Geography, History etc which form integrated SST separately, Combined Social Studies curriculum is not taught from primary schools, secondary schools, in colleges and universities in Kenya, The topics in SST becomes complex as learners progress from lower classes to the upper classes, in most schools of the respondents there are charts and maps of county, Kenya, Eastern Africa and Africa in their school and that SST content offers learners the opportunity to apply what they learnt in school in their daily life.

REFERENCES


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Economic valuation for improve conservation of Yankari game reserve, Bauchi Nigeria

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Abstract- Biodiversity conservation can be seen as avoiding and eliminating any steps that can seriously disturb Yankari game reserve biodiversity ecosystem. Eco-conservation is regarded as an ideal tool for attaining both economic and conservation sustainability. The objective of this study is to determine the adjoining community willingness to pay for improve conservation of Yankari game reserve using a dichotomous choice contingent valuation method (DC-CVM) on 422 respondents from adjoining communities of Yankari game reserve. The result of the study showed that the mean willingness to pay for improve conservation of the reserve by people of the adjoining communities of the reserve is N2, 376.42. The findings to pay for improve conservation of the reserve by people of the reserve. The result of the study showed that the mean willingness to pay for improve conservation of the reserve by people of the adjoining communities of the reserve is N2, 376.42. The findings of this study would provide a guide for the government, policy makers, management of the game reserve and relevant authorities towards achieving improved and sustainable conservation of Yankari game and also take into account the benefits associated with resources conservation and the need for both the public and private organisations to actively and financially participate for future generation to benefit.

Index Terms- Biodiversity, Conservation, Contingent valuation, Eco-conservation, Willingness-to-pay

I. INTRODUCTION

Globally, the rate at which varieties of species of plants and animals were lost supersedes its natural lost (Chanie&Tesfaye, 2015: Medina, Oggunjimmu and Onadeko, 2009). The daily increase of human activities is destructing natural resources which necessitate the establishment of conserve and protected environmental resources globally (Grigoroudis, Petridis&Arabatzis, 2014). Biodiversity conservation can be seen as avoiding and disregarding any steps that can disturb Yankari Game Reserve ecosystem. The rapidly growing ecological resources of the present day society which lead to habitat destruction and fragmentation, extinction of species and the general decline or loss of biodiversity (Frikvist, Erika, 2015; Larby & Patricia, 2009).

Reserves and resources parks establishments are aim at ensuring that varieties of plants species are conserved and protected (Jia, Fu, Feng, Hou, Liu & Wang, 2014: An, Li, Guan, Zhou, Wang, Deng & Jiang, 2007). The main aim of ecosystem conservation is to maintain and protects ecological process which is proved to have continuously contributed significantly in the productive capacity of the protected ecosystem resources, biodiversity genetically materials, protection of culture and rural area development as a whole (Newing, 2010).

II. REVIEW OF LITERATURE

Biodiversity Conservation and Protected area

Conservation is an activity of guarding and protecting of plant and animal species and their habitats (Condamine, Rolland & Morlon, 2013). Conservation is the ethical use and protection of valuable resources, such as plants, minerals, animal, water bodies, land and other resources. It is focused on maintaining the natural sphere in order to safeguard the sources of resources (Soule, Tegene & Wiebe, 2000; Soule & Wilcox, 1980).

Conservation of environmental resources serves as ecosystem maintenance system such as the sequestential of carbon, recreational and educational services, erosion and flooding mitigation and control (Jia, Fu, Feng, Hou, Liu & Wang, 2014). Such areas are to serve as avenues of poverty reduction and job creation and sustainable community and conservation development (Rogerson & Sim, 2012). Therefore, conservation of natural environment resources is a wealth of life which is found on earth plants, animals, microorganisms and the system that exist in (Oulater, & Egonmwan, 2014).

Protected area are referred to as the cornerstone for ecosystem and biodiversity conservation because of its significant in biodiversity conservation and the services it rendered in ecosystem services it offers to our societies (Htun, Mizoue and Yoshida, 2012). Those services rendered necessitated the need for the creation or establishment of protected areas so that the vital resources of the environment will be protected and sustained (Barber, et al., 2012).

Establishment of Nigeria protected areas is traced back to the 17th century and the first protected area to be conserve was the Forest reserves by Mr. Thompson in 1896 at the Colony and protectorate of Lagos (Adekunle, 2007). In 1916, the Forestry Law was reviewed to outspread the jurisdiction of the Forest Department to the Northern protectorate (Hyman, 1993). Conservation of these areas came as a result of the government interest to sustain the natural resources in them for present and future generations to benefit. All the conserved areas have a compact character with biogeographically important attributes. The concepts of conserving wildlife in Nigeria forest game

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reserves came up in the early 1930s, with the suggestion that game reserves should be established in savanna areas of (Ejidike&Ajayi, 2013; Joppa, Loarie&Pimm, 2008; Terborgh, 2002; Afolayan and Ajayi, 1980). Anadu in (1987), suggested that established forest reserves, game reserves, national parks and other protected areas will positively result in protecting natural resources utilization for sustainable human benefits. The conservation policy of natural resources in game reserves, national parks and other protected was as a result of government interest in preventing extinction of most flora and fauna in the wild (Olaniyi, 2016; Olakunle. Omotayo&Odewumi, 2011; Anderson, 2004; Aduradola, 2004). Globalization, industrialization, rapid population boost and urbanization have altered food production patterns and consumption rate in ways that extremely affect ecosystems resources (Barau, Buba, Maikeri, Tukur, Gabuin, Kabir&Danba, 2015; FAO, 2010). Management and conservation of natural resources especially the ones that replenish themselves under optimum conditions necessitate attention to ensure their sustainability. Therefore, the desires for wildlife conservation came into reality through the demarcation of Yankari game reserve (1280 km2 ) in Bauchi State in 1956 and opening it off to the public in 1962 as premier game reserve in Nigeria (Usman&Adefalu, 2010; Ejidike&Ajayi 2013).

The conservation impact and effect on any particular settlement results from a complex set of interacting conditions, some having to do with geography and location, some with the dwelling, and still others with the social and economic characteristics of the people living there (Hewitt, 2014 & 1983; Drabek&McEntire 2003; Quarantelli, 1987 & 1995; Bates and Peacock, 1987). According to Cannon: there are no really generalized opportunities and risks in nature, but instead there are sets of unequal access to opportunities and unequal exposures to risks which the roots of local disaster vulnerability are increasingly recognized to be the pre-existing patterns of community settlement and development (Lobenstein 2014&Diaz &Pulwarty, 2012; Bennett, 2009; Pielke, 2005; Anderson, 1994; Pulwarty and Riebsame, 1997; Pielke and Pielke, 1997), including ‘the on-going social order, its everyday relations to the habitat and the larger historical circumstances’ (Hewitt, 2005 & 1983). The impact of a natural event on any given community, for example, is not random, but determined by everyday patterns of social interaction and organisation, particularly the resulting stratification paradigms which determine access to resources (Bandopadhayay, 2014; Oliver-Smith, 2009 & 1986; Maskrey, 1993 & 1989; Few, 2003; Bolin and Stanford, 1998) are consequences of the socio-economic system.

Economic valuation technique for non-market goods and services

Environmental Valuation Technique is just a branch of environmental economics, which is aimed at allocating values for non-market goods and services which have no market prices. Environmental valuation is considered as a difficult task, most economics have frequently been compelled for attempting to put a “price tag” on environmental resources. However, organisations responsible for natural resources protection and management most often make difficult decision that involve trade-off in allocating resources. These kind of decisions are economic decisions, are based to either be directly or indirectly on the general public values (Samdin, et al., 2008; Bateman et al., 2006).

The principal challenge associated with the application of standard economic technique to the provision of environmental goods, whether directly through public provision or indirectly through regulations, is the issue of assigning monetary value on the resources. Due to the fact that these goods are not usually bought and sold in the market, the real prices and sales information is not obtain more often. As such, economist developed several methods to value non-marketed goods and services consistent with the valuation of marketed goods (Hanley and Splash, 1993).

The Contingent Valuation Method

Cooper 1993, describe applying dichotomous choice contingent valuation as a simple technique of data collection and having standard empirical models of estimating the economic values of natural environmental goods and services. WTP value of a hypothetical change of the environment resources can best be obtained through the questionnaire survey. Responses of WTP questionnaire survey can be used to estimate the net benefit of natural resources to the

According to Yacob et al., (2009) a single bounded DC-CVM is a ‘take it or leave it (TIOLI) bid offer which is offered to respondents with only “Yes or No” option’. Therefore, for the purpose of this study, the single bounded DC-CVM ‘take it or leave it (TIOLI) bid offer option’ was used to elicit respondent willingness to pay for an improve conservation of Yankari Game reserve, Bauchi Nigeria.

CVM is a method that provides individuals with the opportunity to purchase public goods under hypothetical situations, especially in the absence of real market or existing information concerning the real market scenario. It plays a significant role in the establishment of environmental policy (Adamuet al., 2015). The CVM technique is applied in many fields including the protected areas (Ricoet al., 2011), endangered species conservation (Kotchen and Reiling, 2000), ecosystem services (Turner et al., 1995), and also biodiversity conservation (Wang et al., 2012).

III. STUDY AREA

The areas for this study are the adjacent communities of Yankari game reserve. Due to the intense utilization of the land surrounding the reserve, it has become an island of well-developed savannah woodland. The surrounding communities’ comprises small towns and peripheral villages originally founded by farmers and hunters. All adjoining communities of Yankari game reserve are been affected either positively or negatively by the conservation of the area because the section of the land is been protected from any type of developmental activity from an individual or that group of individuals.
Study Population

The populations of the study are the members of the adjoining communities who are above eighteen (18) years of age. And according to national bureau of statistics (NBS, 2010), Alkaleri local government at which Yankari game reserve is located and chosen for this study has a population of 328,284 and 54,714 households.

Sampling technique

The surrounding communities were stratified into four (4) based on their direction from the reserve boundary and also are stratified based on distance proximity to the reserve. However, this study utilized the mapping produce by Local Empowerment and Environmental Management Project (LEEMP) and Global Environmental Facility (GEF) (2008), out of which ten (10) communities were strategically selected using MS excel random number generator and the respondents were randomly selected from the selected communities.

Sampling size

For this study Yamane (1976) formulae of determining sample size was applied, and it is adjudged to be and deemed adequate for CVM analysis (Israel, 1992).

\[
n = \frac{N}{1+N(e)^2}
\]

- Sample size =?
- N: Total number of population of the study =328,284
- e: Level of precision =0.05
- I: Constant

Therefore; 

\[
n = \frac{328,284}{1+328,284(0.05)^2}
\]

\[
=328,284/1+821.71
\]

\[
=399.51 =400
\]

However, 40 (10%) additional questionnaires was added to the 400 sample drawn in order to curtail any problem regarding questionnaire rejection or poor return rate making the total number of the questionnaires to be 440 so as to compensate non-return questionnaires (Ismail, 1992).

Sampling Units

The study sampling units consist of the individuals or households, because it was found that estimates made based on individual sample of respondent yield greater value than household sampling unit (Kaffashi, 2016; Quiggin, 1998). But many authors have argued that if the right decision makers are not interviewed there is high tendency that biased estimates of WTP/WTA could be obtained (Sandorf et al., 2016; Lindhjem and Navrud, 2009; Bateman and Munro, 2009). It is important in a research like this to identify the targeted sampling population whose response is to be elicited for valuation estimate in other to have a relevant policy making.

Questionnaire administration

The structured Questionnaire is the instrument applied in the data collection of this study using the direct face-to-face questionnaire interview method of both the dichotomous choice format.

A hypothetical scenario on the importance of Yankari game reserve and the need for its conservation, and the DC-CVM format was employed to elicit the respondent’s willingness to donate towards the reserve improve conservation. The DC-CVM format of take it or leave it (TIOLI) bid offer consist of only Yes or No option to the respondents and it is adjudged to be the most easier to answer (Yacob et al., 2009). CVM was used to ascertain what the respondents would be willing to donate under the hypothetical market scenario (Adamu, et al., 2015 and Kim et al., 2012).

IV. RESULT AND DISCUSSION

Socio-demographic profile of the Respondents

The output result of the socio demographic characteristics of the respondents is presented in table 4.1 as the total retrieved questionnaires from the respondents was four hundred and twenty two (422) when male respondents constituting 321 (76.1%) while that of women is 101 (23.9%) respondents. These can be linked to the socio cultural and religious belief of Muslims of northern Nigeria that mostly prevent their wives and female associate from staying outdoors and taking part on social activities.

The age mean score of the respondents is 35 years and respondents age ranging from 18-25 years constitute of 107(25.4%), 119(28.3%) while those fall within the range of 26-35 years covered 103(24.4%), respondents fall within the range of 36-45 years, while 53(12.6%) and 40(9.5%) fall within the range of 46-55 years and 56 and above years respectively.

From the survey result, the marital status of the respondents indicates that married respondents constitute of...
279(66.1%) while non-married (singles) are 143(33.9%). The respondent level of education indicates that 105(24.9%) attended a non-formal type of education, those with primary qualification were 83(19.7%), 187(44.3%) respondents that have secondary school qualification constituted majority of the research respondents. Those that attended colleges, polytechnics and university (tertiary education) constituted only 47(11.1%) of the respondents.

The result of the occupational status of the respondents shows that 95(22.5%) are being employed by government while those that are self-employed were 128(30.3%), 133(315%) of the respondents are farmers while unemployed and retirees constitute of 51(12.1%) and 15(3.6%) of the total survey respondents respectively.

Respondents membership to association indicates that 226(53.6%) belong to a particular association that relates to conservation were as those that did not belong to any association constitute of 196(46.4%). From the survey, family size ranging from 1-4 people per house constitute of 187(44.3%), 57(13.5%) respondents fall within the family size range of 5-6, 71(16.8%) respondents fall within the family size range of 8-10s, while 107(25.4%) fall within the range of 11 and above.

The respondents gross monthly income indicates that 167(39.6%) earn between N10,000-N20,000 monthly, those that earn between N21,000-N30,000 were 129(30.6%) while those within the range of N31,000-N40,000 were 97(23.0%) respondents and N41,000-N50,000 were 23(5.5%) of the respondents. Respondents with the highest monthly income of N51,000 above constituted only 6(1.4%) of the survey respondents. The mean score of gross monthly income of the respondents from the result analysis is N25, 597.

<table>
<thead>
<tr>
<th>Table1 Respondents Socio-demographic profile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>-------------</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td><strong>Age</strong></td>
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<tr>
<td>18-25</td>
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<tr>
<td>26-35</td>
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<tr>
<td>36-45</td>
</tr>
<tr>
<td>46-55</td>
</tr>
<tr>
<td>56 and above</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
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<tr>
<td>Non married</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td><strong>Educational level</strong></td>
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<tr>
<td>Non formal</td>
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<tr>
<td>Primary</td>
</tr>
<tr>
<td>Secondary</td>
</tr>
<tr>
<td>Tertiary</td>
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<tr>
<td><strong>Occupation</strong></td>
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<tr>
<td>Self-employed</td>
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<tr>
<td>Farmers</td>
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<tr>
<td>Unemployed</td>
</tr>
<tr>
<td>Retiree</td>
</tr>
<tr>
<td><strong>Membership of Association</strong></td>
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<tr>
<td>Yes</td>
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<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Family size</strong></td>
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<tr>
<td>1-4</td>
</tr>
<tr>
<td>5-7</td>
</tr>
<tr>
<td>8-10</td>
</tr>
<tr>
<td>11 and above</td>
</tr>
<tr>
<td><strong>Level of Income</strong></td>
</tr>
<tr>
<td>N 10,000- N 20,000</td>
</tr>
<tr>
<td>N 21,000- N 30,000</td>
</tr>
<tr>
<td>N 31,000- N 40,000</td>
</tr>
<tr>
<td>N 41,000- N 50,000</td>
</tr>
<tr>
<td>N 51,000 and above</td>
</tr>
</tbody>
</table>
Willingness to Pay Estimation

Among the total number of 440 respondents interviewed during the field survey, 422 were retrieved back fully answered from the respondents. 314(74.4%) respondents indicates that they are willing to pay by choosing “Yes” to various bids (500, 1000, 1500, 2000, 2500) amount offered to them and the remaining 108(25.6%) responded “No” that they are not willing to pay. The result summary of the respondent’s willingness to pay section is presented in table 4.14.

For the initial bid amount offered, 500, 87 responses were obtained and those that indicate “Yes” to the bid amount are 75(17.8%), while those that indicate “No” are only 12 (2.8%) showing their unwilling to pay the amount for improve conservation of Yankari game reserve. The second bid amount is 1000 and 85 questionnaires were returned and fully answered, out of which 71(16.9%) said “Yes” they are willing to pay and 14(3.3%) respondents said “No”. for the third bid amount of 1500, 84 answered questionnaires were retrieved out of which 62(16.7%) were willing to pay by saying “Yes”, whereas “No” respondents are 22(5.2%). The forth bid amount offered is 2000 and has a total response of 83 respondents with 57(13.5%) responding to the “Yes” option while the 26(6.2%) choosing “No” option. The last bid amount 2500 has 83 responses and 49(11.6%) are respondents willing to pay by choosing “Yes” to the bid amount and the remaining 34(8.1%) chose “No” to the bid amount. The willingness to pay response here revealed that the more there is increase in bid amount, the lower the “Yes” response from the respondents which is in line with the economic theory of demand (Kim et al., 2007; Alberini et al., 2003; Cooper, 1993).

Similarly, existence value was the major reason that the respondents gave for their willingness to pay with about 139 (32.9%) saying that they are willing to pay for improved maintenance of the reserve and, 73(17.3%) respondents stated that they are willing to pay because the amount is minor, they can afford it. Other reasons offered for willingness to pay are, for sustainable management of the reserve, natural resources conservation and for future generation to benefit from it with 42(10.0%), 38(9.0%) and 26(6.0%) respondents accordingly.

However, from the “No” responses of 108(25.6%) that are not willing to pay for the improve conservation of the reserve, 48(11.4%) said It is government responsibility alone to conserve the reserve, while 33(7.4%) stated that they didn’t believe that their donation will be used judiciously is their reason for not willing to pay. I have made my contribution through tax is another reason that the respondent gave for not willing to pay with 15(3.6%) respondents. Having no interest in conservation of the reserve is the less response given for not willingness to pay for improves conservation of the reserve with about 12(2.8%) respondents.

Table 2 Summary of WTP base on Bids

<table>
<thead>
<tr>
<th>Bid Amount</th>
<th>Yes Freq. (%)</th>
<th>No Freq. (%)</th>
<th>Total Freq. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 500</td>
<td>75 17.8</td>
<td>12 2.8</td>
<td>87 20.6</td>
</tr>
<tr>
<td>N 1000</td>
<td>71 16.8</td>
<td>14 3.3</td>
<td>85 20.1</td>
</tr>
<tr>
<td>N 1500</td>
<td>62 14.7</td>
<td>22 5.2</td>
<td>84 19.9</td>
</tr>
<tr>
<td>N 2000</td>
<td>57 13.5</td>
<td>26 6.2</td>
<td>83 19.7</td>
</tr>
<tr>
<td>N 2500</td>
<td>49 11.6</td>
<td>34 8.1</td>
<td>83 19.7</td>
</tr>
</tbody>
</table>

Logistic Regression Models

Binary logit regression model is the statistical tool employed in this study to examine the relationship between the willingness to pay as the dependent variable and the socio-demographic variables of Age, Gender, Level of Education, monthly income, Membership to Association and Bid amount as independent variables.

Logit Regression Model

Based on the model result has been present in table 4.15 those six (6) independent variables are found to be significant at varying levels, and all the six (6) variables have a coefficient, marginal effect and significant level (P value). The coefficient of each variable is entailing two(2) vital information of sign and weight. In a situation where by the coefficient has a negative sign, it is entailing an inverse relationship between the said variable and the WTP. Coefficient weight on the other hand is the coefficient value that presents the level of strength of the variable in determining the WTP. All of the six (6) variables of Age, years of Education, income, membership to Association and Bids have positive coefficient at varying weight.

Age is another relevant variable that is used in determining WTP in the model. The result of the finding shows that age has a positive coefficient with weight of .07937426 and found to be significant at 1% confidence level. The finding indicates that as the age of respondents increase, their WTP also increase. Therefore older people among the respondents have higher WTP than younger ones Scholarly view on positive and significant relationship between age and WTP as said by Bhandari and Heshmati, (2010); Barel et al., (2008), and Le and Mjelde, (2007). Other scholars such as Montes, Benayas and Marti, (2007) and Reynisdottir et al., (2008) have divergent views on that issue.

Next important variable with most effect on WTP in this study is the years education of the respondents, which is coded in dummy (0= non-formal education, 1= primary education, 2= secondary education and 3= tertiary (colleges, polytechnic and university). Educational level have a positive coefficient value with weight of .10712621 and statistically significant at 1%
confidence level. The position of coefficient shows that those with higher level of education are more willing to pay than those with low or lower level of education. The result output is signifying that educated people are believed to have more information and awareness on resource conservation than those with lower level of education. Therefore, influence of education on WTP is being reported by researchers such as Wang and Jia (2012) and Barel et al., (2008).

Another important variable in the WTP model is income of the respondents, which also have a positive coefficient of 860987D-04 and significant at 1% confidence level. It is calculated from the model that as the income of the respondents increase, their willingness to pay also increases. This implies that, respondents with higher income have higher possibility of WTP than those with low or lower income. This determination is in compliance with many literatures of determining WTP (Wang and Jia, 2012), Bhandiri and Heshmati, 2010; Reyinisdottir et al., 2008; Seongseop, Wong and Cho, 2007 and Togridon, 2006).

Membership of associations that are related to resource conservation is another variable with positive coefficient and it is also coded as dummy variable (1= Yes and 2= No. its coefficient weight is 1.23605962 and it is significant at 1% confidence level. This reveals that those respondents that belong to any association that relates to environmental conservation have more willingness to pay than those that are not members to any. This result finding is in line with the findings of Baral et al., (2008) and Messick and Brewer (1983) where members of NGOs are high WTP.

In the study, Awareness of respondents is found to be positively significant with coefficient weight .03943391 and significant at 5% confidence level. This show a high elasticity of gender for willingness to pay, indicating that those respondents with positive or high level of awareness are more willing to pay for improve conservation of Yankari game reserve. The said result may be associated to factors low level of education of women and income. This outcome coincides with Findings of many studies with positive relativity positive awareness and willingness to pay (Brécard et al., 2009; Clark et al., 2003; Messick and Brewer, 1983).

However, the sixth variable is Bid amount. Bid amount carries a negative sign on its coefficient weight at -.00120365 as expected and significance at 1% confidence level. As explain earlier, a negative sign is an indication of inverse relationship between the variable and WTP. This implies that as the bid amount increases, the WTP is decreasing. Therefore in this situation the higher the increase in bid amount the lower the possibilities of the respondents’ willingness to pay (Baral et al., 2008; Loomis, et al., 2000).

### Table 3 Logit Regression Model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>Marginal effect</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-5.415</td>
<td>.0000</td>
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<tr>
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<td>.00022487</td>
<td>5.834</td>
<td>.0000</td>
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<tr>
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<tr>
<td>INC</td>
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<td>.162605D-04</td>
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<tr>
<td>AWR</td>
<td>.03943391</td>
<td>.01319898</td>
<td>2.442</td>
<td>.0028</td>
</tr>
</tbody>
</table>

Number of observations 422
Log likelihood function -152.615
Mcfadden Pseudo R-squared .55837
Percentage correct prediction 85.071

Note: ***Significance at 1%, **Significance at 5%, *Significance at 10%

### Mean Willingness to Pay for Estimation

The single bounded dichotomous choice of contingent valuation method (DC-CVM) was employed for the purpose of this study, therefore the result outcome will be in dichotomous state of two (2), either the respondent is willing to pay by choosing “Yes” option for the offered bid or not willing to pay the offer bid by choosing “No” to the question. The mean willingness to pay is calculated using the logit regression result using the mean willingness to pay derived equation stated in the previous chapter. Nigerian naira (N) is the unit currency used for the monetary estimation.

The mean Willingness to pay for Improve Conservation of Yankari game reserve

The mean WTP amount estimated using the logit regression model was calculated using the equation formulae stated earlier. The mean Willingness to pay for the respondents for the improve conservation of Yankari game reserve is estimated at about N2376.42. This amount indicates that the respondents are willing to pay higher than the highest bid amount so that the reserve will be conserve base on the reasons they stated in table 4.5 and Table 4.6. The WTP and mean WTP amount of the respondents based on the various socio demographic (Gender, Age, Educational level, membership of Association and Income) variables were also estimated.

### V. Conclusion

in the States and Traditional / Customary Conservation Practices in Nigeria.

Importance is given to protected areas such as game reserves and national parks, protecting endangered species from extinction and poaching. Human activities have greatly affected such areas and make them more vulnerable and the land degraded, but the reason for such threats is either because the government and the reserve management has been unable to provide development projects and control the threats affecting the reserve and lack of enough funding (Kaffashi et al. 2012).

The logit estimation models with the socio-demographic variables has shown that the probability of a “yes” response was significantly correlated (positively) with the communities respondents awareness, level of education, age, household income, membership to environmental related associations and negatively correlated with the donation bid price. Mitchell and Carson (1989) explained that the theoretical study on CVM requires regrssion of the WTP bid amount against respondents socioeconomic variables using mean WTP estimation formulae as:

$$\text{Mean WTP} = \frac{\beta_0 + \sum \beta_i X_i}{(\sum \beta_i)}$$

Cameron, (1988). The result helps to estimate the mean willingness to pay (MWTP). The results obtained, revealed the MWTP contribute of the respondents for improve conservation of Yankari game reserve biodiversity.

These studies offers a valuable policy guide by revealing relative economic value in natural resources management context for proper and rigorous environmental policies towards incorporating and identify the class of stakeholder that can contribute economically, socially and environmentally for the sustainability of the reserve resources. The results can be helpful for other conservation areas in Nigeria and other developing countries with similar nature-based resources problems. Furthermore, these research finding can contribute to the increasing literature on application of contingent valuation method for natural resources conservation in developing countries.

The findings of this study therefore suggest that, the adjoining communities of Yankari game reserve are positively supporting and willing to donate towards the improve conservation of the reserve; therefore the reserve conservation program must involve the adjoining communities.

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The Role of Leaders on the Performance of Water Resources Projects in Kwale County

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Abstract- Water resources projects are essential to the population of Kwale County as well as being the pillar that support most projects in agriculture and fisheries sectors. In this study, the role of leaders such as coordination, change agent, conflict resolution and monitoring were analysed, and the findings showed how the leader’s roles influenced performance of projects and ultimately dictate the success of these projects. From the study, it was important for leaders to optimize performance measurement on projects so as to provide the basis for assessing how well projects progressed toward the planned and achieved targeted objectives. The study was conducted through a descriptive design. The target population for the study constituted 21 water resources projects that had a total population of 190 participants. The sample frame was 62 as the sample size which was 30% of the total population. The instrument for primary data collection was a structured questionnaire with questions anchored on a five (5) point Likert type ranking scale. The data processing and analysis was done mainly by descriptive analysis and the use of statistical package for social science (SPSS Version 20) to produce presentable summaries of the data and findings. A multiple regression analysis was used to explain the existence of a relationship between the independent variable; (Coordination role, Change agent role, Conflict resolution role and Monitoring role) and the dependent variable; (Performance of water resources projects). The findings indicated that the role of leaders as coordinators, and monitoring had a higher influence on the performance of water resources projects in Kwale County. Additionally, the study concluded that monitoring role should be a continuous task thought all project phases especially in areas relating to resource utilization, budget and the timelines defined in the project briefs and schedule.

Index Terms- Performance of Projects, Project Leadership, Role of Leaders, Water Resources Projects.

I. INTRODUCTION

Modern project management practices require effective leadership to be core to the successful project execution especially in this digital era where tough global competition, complex negotiations, challenges in integration and a dynamic trend toward decentralization of project management activities is becoming a norm. (Damousi, Rubenstein, and Tomsic, 2014) define leadership as not a position or a person but a process of influence, often aimed at mobilising people towards change for example, in values, attitudes, approaches, behaviours and ideologies. Similarly, Northouse (2010) defines leadership as a process whereby an individual influences a group of individuals to achieve a common goal. In contemporary project environments the leadership task might involve, supporting groups to face realities and accept responsibilities, creating opportunities and encouraging aspiring leaders to foster social learning or sustainable problem-solving. Project leaders lead the project team and other major stakeholders to achieve desired project objectives within specified constraints. (Richman, 2011) Project leadership as the presence and process carried out within an organizational role that assumes responsibility for the needs and rights of those people who choose to follow the leader in accomplishing project results. (Cleland and Ireland, 2007). In this respect then, project leaders are responsible for setting direction, aligning people and tasks and monitor people to ensure project goals are achieved and give power and significance to the project effort.

Water Resources: Global Perspective

Water is essential to human development and prosperity, but many people still live without reliable access to it. For the 748 million people without dependable access to improved sources of drinking water and the 2.5 billion without adequate sanitation, this means living with the continual threat of illness, lost income, and malnourishment. (USAID Report of Water Sector Activities, 2015)

In one of recent reports, (World Bank & Huffman, 2014) argue that countries cannot grow sustainably, or strengthen their resilience to climate change, without smart water management that takes into account decreasing water availability and quality, and the need for deliberative allocation based on social, environmental, and economic needs. At least 2.5 billion and 768 million people in the world remain without access to improved sanitation and water, respectively. Providing these services sustainably requires integrated planning and management, including securing a quality water supply.

Water Resources: Local Perspective

Kenya as a country is facing a number of serious challenges related to water resources management. A number of these challenges are as a result of factors both within and outside the water sector. Climate variability and increasing demand for water as a result of development and population pressure are factors that the sector may not be able to control but can initiate mitigation measures to ensure sustainable water resource development. Kenya is among the countries to being affected especially due to the rapid population growth, urbanization, rampant deforestation activities and general global warming conditions. As is the case in majority of counties in Kenya, water infrastructure in Kwale County is unreliable with most piped
water systems centered around urban/commercial centers thus disproportionately affecting access and water portability in sparsely populated areas and rural population. (County Government of Kwale, 2013). The main sources of water are boreholes, springs, dams, water pans and rock catchments. The average distance to the nearest water point in the County is two Kilometers. This is well above the internationally required five meters distance to the nearest water source. However, most of the rivers are seasonal thus cannot be relied upon to supply the much needed water in the county for both agriculture and household uses. According to the Publication of (KNBS and SID, 2013), Msambweni constituency has the highest share of residents using improved sources of water at 74%. That is three times Lunga-Lunga constituency, which has the lowest share using improved sources of water. Msambweni constituency is 27 percentage points above the county average. Ukunda ward has the highest share of residents using improved sources of water at 88%. That is 87 percentage points above Ndavaya ward, which has the lowest share using improved sources of water. Ukunda ward is 41 percentage points above the county average. (County Government of Kwale, 2013).

In this study, the role of leaders on the performance of the different water resources based development projects was analysed. Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Cheung et al. 2004).

**Statement of the problem**

Kwale County faces a myriad of challenges across sectors of social and economic development. Marshall (2011), says water scarcity has been a major issue in Kenya, caused mainly by years of recurrent droughts, poor management of water supply, contamination of the available water, and a sharp increase in water demand due to relatively high population growth. The shortage has been amplified by the government’s lack of investment in water, especially in rural areas, and lack of leadership in the guidance and management of scarce water resources we have in the country. Although some of the challenges are common across most sectors, such as poor infrastructure and poor management system among others, quite a number are unique to specific sectors (County Government of Kwale, 2013). However, a lot of problems related to leadership and commitment to the course of the projects affecting the goal attainment of these projects in general and therefore having a negative impact on the social development of Kwale County residents.

Robertson and Williams (2006), argues that despite advances in project management methodologies many projects continue to fail for a number of reasons and the most common being performance. In relation with Mullaly’s (2004) findings, Thamhain (2004a) suggested that many factors, which drive project performance, are derived from the human side. Among these factors, managing conflicts and problems in projects is an important determinant of project success. Another research study by Cambridge University’s School of Business and Economics concluded that 80% of projects failed because of poor leadership (Zhang and Faerman, 2007). The findings further suggested that poor leadership skills reflected limited or no teamwork, inadequate communication, and an inability to resolve conflicts as well as other human related inefficiencies (Thompson, 2010). Therefore, project leaders and project managers in the counties are under immense pressure to deliver projects successfully by ensuring that they manage performance throughout the project life cycle in order to effectively satisfy expectations of the people in their county.

**Research Objectives**

**General Objectives**

The general objective was to evaluate the role of leaders on the performance of water resources projects within Kwale County.

**Specific Objectives**

1. To examine the role of leaders as coordinators on the performance of water resources projects in Kwale County.
2. To investigate the role of leaders as change agents on the performance of water resources projects in Kwale County.
3. To assess the role of leaders in conflict resolution on the performance of water resources projects in Kwale County.
4. To examine the role of leaders in monitoring on the performance of water resources projects in Kwale County.

**II. CONCEPTUAL FRAMEWORK**

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
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<tbody>
<tr>
<td>ROLE OF LEADERS</td>
<td>PERFORMANCE OF WATER RESOURCES PROJECTS</td>
</tr>
<tr>
<td>Coordination Role</td>
<td>Performance of water resources projects</td>
</tr>
<tr>
<td>Change Agent Role</td>
<td></td>
</tr>
<tr>
<td>Conflict Resolution Role</td>
<td></td>
</tr>
<tr>
<td>Monitoring Role</td>
<td></td>
</tr>
</tbody>
</table>

*Fig 2.1: Conceptual Framework (Source: Author, 2016)*

**Role of leaders on the performance of projects**

The nature and characteristics of projects being unique, time bound, and often associated with complexity, unknowns and uncertainty makes leaders’ role more challenging than as would...
be in non-project environments. The key roles of leaders analysed in this study included:

**Coordinator role**
Coordinating is the function of establishing such relationships among various parts of the organization that they all together pull in the direction of organizational objectives. It is defined as the interrelation of functions, structures, and resources in an organizational context (Vinnamäki, 2004). It is thus the process of tying together all the organizational decisions, operations, activities and efforts so as to achieve unity of action for the accomplishment of organizational objectives which can take place at different levels or possess different dimensions. In project management coordination will ensures unity of action among individuals, work groups and departments, and brings harmony in carrying out the different activities and functions so as to achieve the project goals efficiently. Coordination is achieved by synchronizing the actions of line managers, project managers, decisions taken at various hierarchical levels, and the action taken by employees from different structural departments to achieve efficiently the projected goals. Meredith & Mantel (2009) argue that the most difficult aspect of implementing the plan for a complex project is the coordination and integration of the various elements of the project so that they meet their joint goals of performance, schedule, and budget in such a way that the total project meets its goals. In this case, the coordinator is the glue that holds the team and its tasks together to meet deadlines and deliverables for the project.

**Role as change agents**
In contemporary organizations’ change is on a continuous basis and especially when the organizations face external pressure to cope with technology, satisfy expectations of its stakeholders and remain competitive in a global market. The rate at which change is present in contemporary projects requires excellent leadership personality and desire to willingly change by all those whom the change will affect. It is important leaders have to play a bigger role in ensuring that the needed change is effectively implemented and managed. Similarly, ensuring that all the factors necessitating the change are clearly understood and communicated to all in the project will be critical for a successful change process. Burns (2009) defines change agents as “people responsible for directing, organising, and facilitating change in organisations”. Likewise, Hughes (2010) citing Lewin (1997) also define change agent as “a rational actor who defines, directs, and manages feedback during the implementation of change”. This definition bodies well within project environments and more so where projects and management of those projects plays a critical role to achieving the objectives of an organisation as it is in the case of Kwale County. The nature of projects means they are bound to be affected by changes both internal and external, this calls for proper planning and management of the changes that occur in order to realize the strategic goals set by the County. Leaders play a key role as change agents since they initiate and influence the adoption of changes that affect the organisation and projects. Project leaders are change agents in project environment; as such they have to use knowledge of employees, project team members and proper change management techniques to minimize the cost of change. Once a project is initiated, alterations during project life cycle and implementation often affect the project with respect to cost, time and scope of project outcomes. The implication of changes in these key project variables will in the end have an adverse effect on the performance of the project in question. One major change likely to affect water resources projects is the change of mandate. Meredith & Mantel (2009), argued that change by mandate raises an additional problem. Not only are the project’s deliverables, budget, and schedule usually changed, the priorities of other projects are typically changed too, if only temporarily while the mandate receives the system’s full attention. This challenges are very common especially where the tasks of key projects have been devolved and leadership personnel in the Counties feel they want more ownership of projects.

**Conflict Resolution role**
Conflicts are a way of life in project environments and generally occur at any time or stage in a project life cycle. Kohlrieser (2007), argues that conflict manifests itself as a difference between two or more persons or groups characterized by tension, disagreement, emotion or polarization, where bonding is broken or lacking. Irrespective of the nature or type of conflict, it will have an impact on the project outcome and performance. As leaders, it is important to understand that conflicts will occur at one stage in the project, so putting up preventive measures and proper controls will help manage the impact the conflict may have on the performance of your projects.

Project environments are particularly vulnerable to generating conflict especially where a large number of beneficiaries and stakeholders are involved. Water resources projects undertaken in Kwale County are most likely to have same problems since the environment where they are initiated and implemented is very dynamic and often affected by changes in political leadership with vested interests from the political leaders. However, as Kerzner (2004) suggests sometimes conflict is meaningful and produces beneficial results. These meaningful conflicts should be permitted to continue as long as project constraints are not violated and beneficial results are received. Involvement of all affected stakeholders, good communication and the desire to empower the local communities through these projects will be key to attaining project success. Similarly, Identification, analysis, and evaluation before taking action are the keys to effective management of conflict. Project managers must use practical strategies that involve following three steps: preparing for conflict, facing conflict, and then resolving conflict. (Thamhain and Wilemon, 1975). As a leaders in the project you need essential interpersonal skills, including effective communication, negotiation, and appreciation of cultural differences in order to handle conflicts involving diverse communities.

**Monitoring role**
Raut, Pimplikar and Sawant (2013) describe project monitoring as a managerial process which aims to generate information to support decision-making and to stimulate cost reduction, value improvement and continuous improvement in the organisation. Therefore project monitoring is a holistic management process that involves collection, recording, reporting and disseminating information concerning performance achieved or forecasted in projects to ensure project objectives are achieved within the agreed implementation schedule or plans. Through monitoring the project manager and leaders are able to also perform control function which is a management function that involves
comparing and correcting work performance. The fundamental role of monitoring is to evaluate success in relation to expected results based on the goals or objectives of the projects as set out during the initiation and planning phase in the project life cycle. Schwalbe (2009), says that monitoring involves regularly measuring progress to ensure that the project is meeting its objectives and addressing current business needs. The project manager and other staff monitor progress against plans and take corrective action when necessary. In order to achieve effective project performance, the variables of time, cost and scope must be closely monitored and controlled since they have a great influence on the performance outcomes of the project at hand. Mitra (2010) suggests that project performance monitoring is an area one should spend significant time on and you need to measure project success against established performance parameters. In this case as a leader you have to take a proactive role to ensure the execution of your projects are achieved within the agreed project performance benchmarks. Leaders’ ability to inspire and motivate project team members will play a critical role to ensure all activities in the project are undertaken according to the agreed schedule. Schwalbe (2009), agree that many project managers often cite delivering projects on time (schedule control) as one of their biggest challenges, because schedule problems often cause more conflicts than other issues.

Project performance
Project performance can be measured and evaluated using a large number of performance indicators that could be related to various dimensions (groups) such as time, cost, quality, client satisfaction, client changes, business performance, health and safety (Cheung et al. 2004). Time, cost and quality are, however, the three predominant performance evaluation dimensions. As Hill (2010) points out project performance analysis is that aspect of project management that examines planned project events and outcomes relative to actual project events and outcomes primarily in terms of cost, schedule, and resource utilization. It therefore provides the project leaders and project team with analytical indications of project progress and status of ongoing activities.

Another interesting way of evaluating project performance is through two common sets of indicators (Pheng and Chuan, 2006). The first set is related to the owner, users, stakeholders, and the general public; the groups of people, who will look at project performance from the macro viewpoint. The second set comprises the developer and the contractor; the groups of people who will look at project performance from the micro viewpoint. As discussed by Purvey et. al. (2007), performance measurement systems were developed as a mean of monitoring and maintaining organizational control. In order to analyse and monitor performance, a common and widely adopted model of earned value analysis (EVA) is often employed. Earned value is the amount of planned work that has been accomplished to date and represents the value that has been achieved by the project to date as a result of that work accomplishment. (Hill, 2010). The analysis returns or information gives clear indication of the performance of work activities in the project and it can help decision makers within the project make informed decisions of what to do to improve performance supposing it is below expectation. Hill (2010) further discusses that earned value analysis is based on the following elements: First; Budgeted Cost of Work Performed (BCWP) - the value, in dollars, of the work accomplished to date. It is also known as earned value because the value associated with a particular work package is earned when the task is completed. Second; Budgeted Cost of Work Scheduled (BCWS) - the value, in dollars, of the work scheduled (planned) to be completed to date, that is, the project budget. BCWS is the planned value for the planned work. Third; Actual Cost of Work Performed (ACWP) - The value, in dollars, of the actual cost expended for project work performed to date.

METHODOLOGY

Research Design
A research design is the conceptual structure within which research is conducted since it constitutes the blueprint for the collection, measurement and analysis of data. Creswell (2014), defines research design as plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis. He further states that the selection of research design is also based on the research problem or issue being addressed, the researcher’s personal experience and the audience for the study. The researcher used a descriptive survey to investigate the role of leaders on the performance of water resource projects in Kwale County. Sekaran & Bougie (2011), describe a descriptive study as one undertaken to ascertain and be able to explain the characteristics of the variables of interest in a phenomena. The purpose is therefore to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation. Since the research was meant to test rather than generate theory, it adopted this quantitative approach which focuses on describing and drawing inferences from the findings on the relationships between water resources project performance, and the role of leaders such as coordinators, change agents, conflict resolution and monitoring. It also allowed the researcher to think systematically about aspects in a given situation, offer ideas for further probe and help make certain important decisions.

Population
The targeted population for the study comprise project committee members, project coordinators involved directly or indirectly in the implementation and management of water resources projects within Kwale County. The projects under study were twenty one (21) and a total of 190 personnel from across the 21 projects were used as the target population.

Sample and Sampling technique
The sampling frame is a physical representation of all the numbers in the population from which the sample is drawn. (Sekaran & Bougie, 2010). The research used purposive sampling which is a form of non-probability sampling in which decisions concerning the individuals to be included in the sample are taken by the researcher, based upon a variety of criteria which may include specialist knowledge of the research issue, or capacity and willingness to participate in the research. (Kothari, 2011). This method expose the researcher to various participants who had different experiences on issues concerning implementation and management of water resources projects.
The selection criteria was based on the number of project committee members involved in each project under study. From the target population of 190 which is also a sample frame, the research obtain 62 respondents as the sample size that were subject to investigations.

Research Instruments

Questionnaires were used to gather data because the information was supposed to be collected from diverse groups and projects. Archival documents were also be used as secondary data. This documents included completed projects documentations, project reports, and project work plans. Regular cross checking and follow ups was done to ensure accuracy, relevance, completeness, consistency and uniformity of the data collected.

Data collection procedure

The data collected by the researcher was through distribution of formulated questionnaires to the respondents. Sixty two questionnaires were distributed to the responders and the researcher had to be involved on two occasions to guide filling of the questionnaires for three respondents who did not understand key questionnaire items. Half of the questionnaires specifically were sent in Msambweni, Kwale and Lung Lunga sub-counties were collected after three weeks from that date of administering, while the remaining questionnaire documents were collected after five weeks.

Pilot test

Pilot study of the questionnaire were conducted by a scouting sample of five questionnaires with the aim of testing the suitability of the instruments to be used for data collection. These questionnaires were distributed to project committee members in relevant projects under study two weeks before the actual data collection process, in order to assess the reliability and validity of the instruments used.

Reliability

In this study, the reliability of the questionnaire were analysed using a Cronbach’s alpha coefficient. This helped determine the level of accuracy and reliability of the obtained data from the pilot study. Cronbach’s alpha was considered appropriate since according to Zinbarg et al (2005), Cronbach’s alpha is a coefficient of reliability that gives an estimation of data generalization without any bias and it requires only a single test administration to provide a unique estimate of the reliability for a given test. In this research study, the findings of the Cronbach’s alpha gave a value of 0.718 which indicated that the items on the questionnaire gave a consistent outcome and therefore were reliable for carrying out the study.

Table 3.2: Reliability Statistics

<table>
<thead>
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<th>Cronbach's Alpha Based on Standardized Items</th>
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<td>.727</td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Source: Researcher, (2016)

Validity

The instruments for this study were validated through application of content validity, which was determined by expert judgment by knowledgeable lecturers and researcher's supervisors.

Data processing, analysis and presentation

This process involved data cleaning to eliminate discrepancies and thereafter classified on the basis of similarity and tabulated. Then the data was organised into four objectives of the study, classified, tabulated and summarized using descriptive measures, percentages and frequency distribution tables for presentation of findings. Descriptive analysis approaches were used to find the views of the respondents on performance of water resources projects and to investigate the relationships between the variables and the extent to which the independent variables explained the performance of projects. (Creswell, 2009).

A regression analysis was used to determine the relationships that existed between variance in the dependent variable that were explained by the independent variables since there existed more than one study variable affecting project performance. Regression attempts to determine whether a group of variables together predict a given dependent variable. In this study performance of water resources projects was regressed against four independent variables: coordination role, change agent role, conflict resolution role, and monitoring role. The regression equation used in this study was:

\[ Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \]

Where:  
- \( Y \) = the dependent variable that measured performance of water resources projects.
- \( \alpha \) = Constant term indicating the level of project performance in the absence of any independent variables.
- \( \beta_1, \beta_2, \beta_3 \) and \( \beta_4 = \) are the coefficient functions of the independent variables.
- \( X_1 = \) Represented the independent variable that measured coordination role.
- \( X_2 = \) Represented the independent variable that measured change agent role.
- \( X_3 = \) Represented the independent variable that measured conflict resolution role.
- \( X_4 = \) Represented the independent variable that measured monitoring role.
- \( \epsilon \) = Error term represented other factors other than the above leaders roles variables which were not defined in the model.

III. RESULTS AND ANALYSIS

Response rate

A total of 62 (Sixty two) questionnaires were distributed to the target respondents. Fifty five (55) were returned translating to 89% return rate. The high return rate was as a result of making several visits to the sites to make sure most of the respondents return the questionnaires.

Role of leaders on project performance

In responding to which role has a greater influence on the performance of projects, 69% of the respondents agree that coordinator role has a very high influence on performance of water resources projects, followed by monitoring role at 62%, then followed by conflict resolution role at 51%, and finally change agent role at 42% being the percentage of respondents...
who agree that the role of change agent is important in influencing project performance. Further, 4% of the respondents confirm that conflict resolution has very low influence on project performance.

Project Performance
The performance of a project is critical to all projects irrespective of their scope as it helps define the success or failure of that project. Hill (2010) asserts that project performance analysis is that aspect of project management that examines planned project events and outcomes relative to actual project events and outcomes primarily in terms of cost, schedule, and resource utilization. Based on this, the research sort the views of the respondents on how they rated their projects performance and their views are summarized in the table 4.23 as shown.

Table 4.23: Overall views on project performance indicators.

<table>
<thead>
<tr>
<th>Overall, where do you rate the performance of your project in relation to the project meeting or fulfilling the criteria of Time (Schedule), Cost (Budget), resource utilization and meeting its objectives?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td>Very Poor</td>
</tr>
<tr>
<td>Poor</td>
</tr>
<tr>
<td>Average</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>Very Good</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Researcher, (2016)

From the findings as summarized in (table 4.23), 11% of the respondents rated the performance of their projects to be very good, while 20% rated their project performance as good. A bigger percentage of the respondents i.e. 51% rated their projects performance as average, while 16% of the respondents gave the rate of poor. Finally, only 2% of the respondents rate the performance of their projects as very poor, which may indicate the projects is not within the planned time, cost and over-utilized resources available. It may also indicate the project has not meet its objectives.

Regression Analysis
In this study, a multiple regression analysis was conducted to test the influence among predictor variable (Coordination role, Change agent role, Conflict resolution role and Monitoring role), to the dependent variable performance of water resource projects. The research used a statistical package for social science (SPSS v20) to code, and compute the measurements of the regression model.

Table 4.24: Model Summary

<table>
<thead>
<tr>
<th>Model Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Monitoring role, Change agent role, Coordinator role, Conflict resolution

Source: Researcher, (2016)

Table 4.24 is a regression model summary showing how the independent variable combined influence the performance of water resource projects. The value of (R) is positive 0.784, indicating the existence of a positive correlation between role of leaders and performance of water resources projects. The coefficient of determination (R²) of the model is 0.688 meaning that 68.8% of the performance of water resources projects in Kwale County is influenced by role of leaders in those projects in the county. Equally, it also means that 68.8% of the variations in the performance of water resources projects in the County is explained by the role of leaders as coordinators, change agents, role in conflict resolution and monitoring role. Further, the adjusted R² indicates that 12.3% of the performance of water resource projects is influenced by the role leader’s play.

Table 4.25: ANOVA

ANOVA²

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>12.443</td>
<td>4</td>
<td>3.111</td>
<td>2.898</td>
<td>.031b</td>
</tr>
<tr>
<td>Residual</td>
<td>53.666</td>
<td>50</td>
<td>1.073</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>66.109</td>
<td>54</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Performance of Water Resource projects
b. Predictors: (Constant), Monitoring role, Change agent role, Coordinator role, Conflict resolution

(Source: Primary data, 2016)

From table 4.25 (ANOVA table), it is clear that the regression model predicting the relationship between the dependent variable and the independent variable is significant at p=0.031 which is <0.05.

Table 4.26: Coefficients

Coefficients²

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>3.123</td>
<td>1.853</td>
<td></td>
</tr>
<tr>
<td>Coordinator role (X₁)</td>
<td>0.815</td>
<td>0.105</td>
<td>0.474</td>
</tr>
<tr>
<td>Change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change agent role (X₂)</td>
<td>0.217</td>
<td>0.145</td>
<td>0.198</td>
</tr>
<tr>
<td>Conflict resolution (X₃)</td>
<td>0.106</td>
<td>0.157</td>
<td>0.090</td>
</tr>
</tbody>
</table>

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IV. CONCLUSIONS

This study analyzed the role of leaders such as coordination, change agent, conflict resolution and monitoring to determine how they influence performance of water resources projects and ultimately dictate the success of these projects in Kwale County. The findings showed that role of leaders was very critical in enhancing coordination, mutual trust and respect, and communications across organizational lines which can enhance the overall performance of projects.

The fourth objective was to examine the role of leaders in conflict resolution on the performance of water resources projects in Kwale County. This role had a relatively high positive influence with over 60% of the respondent suggesting it is the second most important variable to influence performance of water resource project. The monitoring role covered key aspects of result monitoring, schedule monitoring and cost monitoring. The results also indicated that failure to monitor project activities will drastically affect the performance of projects being undertaken. Since there are high expectations from the local community to ensure the success of these critical projects, leaders are compelled to undertake close monitoring to ensure they deliver on the project outcomes and that the allocated funds to the projects are accounted for effectively.

These findings on the monitoring role of leaders on the performance of water resources projects concur with studies on factors affecting performance of projects by (Kihoro & Waiganjo, 2015) who concluded that project activities need to be properly monitored and documented irrespective of the nature and magnitude of the project. This would provide information necessary for monitoring and evaluating various project challenges and hence prevent future recurrence of such project shortcomings.

The first objective of the study was to examine the role of leaders as coordinators on the performance of water resources projects in Kwale County. As far as the coordinator role is concerned, the results showed that the level of coordination by leaders highly influences the performance of water projects. From the study findings, over 75% of the respondents agreed that by enhancing communication, having periodic meetings and coordinating resources and other project activities, the performance of projects significantly improves. The findings of these study are in agreement with (Kihoro & Waiganjo, 2015) who concluded that project activities need to be properly coordinated and documented irrespective of the nature and magnitude of the project. This would provide information necessary for monitoring and evaluating various project challenges and hence prevent future recurrence of such project shortcomings.

The second objective related to the role of leaders as change agents and the findings showed that leaders being champions of change in projects has an impact but not very influential. Only about 35% of the respondents agreed that by leaders being champions of change and change implementers they need to manage and control changes in projects in order to improve their performance.

The third objective was to assess the role of leaders in conflict resolution on the performance of water resources projects in Kwale County. The findings indicated that less than 30% of the respondents felt that the approach or strategy the leader adopts in handling a conflict will have an influence on project performance. The respondents agreed that it is important for the leader handles the conflict well and resolves it without bias however that will not influence the performance of the projects. This findings differ with studies by Thamhain (2004b) who found that satisfying personal and professional needs of team members will have the strongest effect on team performance, and identified some other factors, which include ability to resolve conflict, mutual trust and respect, and communications across organizational lines which can enhance the overall performance of projects.

From the regression equation, it can be established that taking all factors into account (Coordination role, Change agent role, conflict resolution role and monitoring role) constant at zero performance of water resources projects will be 3.123. Further, the presented findings indicate that taking all other independent variables at zero, then a unit increase in coordination role would lead to a 0.815 increase in the performance of water resources projects, a unit increase in change agent role would lead to a 0.217 increase in the performance of water resources projects, while a unit increase in conflict resolution role would lead to a 0.106 increase in the performance of water resources projects in Kwale County. Finally, a unit increase in monitoring role would lead to a 0.576 increase in the performance of water resources projects.

**Discussion of the results**

The first objective of the study was to examine the role of leaders as coordinators on the performance of water resources projects in Kwale County. As far as the coordinator role is concerned, the results showed that the level of coordination by leaders highly influences the performance of water projects. From the study findings, over 75% of the respondents agreed that by enhancing communication, having periodic meetings and coordinating resources and other project activities, the performance of projects significantly improves. The findings of these study are in agreement with (Kihoro & Waiganjo, 2015) who in their study of factors affecting performance of construction projects concluded that there should be continuous coordination and proper relationship management between all stakeholders involved in the project. Proper channels should be used to solve problems during the project life cycle and develop performance of the project. Similarly, these finding concur with (Gray and Larson, 2005), who found that openness and transparency in communication are essential to nurture human relationships; predictability and openness are important factors in establishing trust within project teams.

The findings showed that role of leaders was very critical in determining how the projects performed. The role of...
coordination and monitoring were found to have the greatest influence and this points to the need for fostering good human relation within project teams and at the same time continuously monitor project activities to manage deviations from plans. The research tested the relationship between independent variable (roles of leaders) and dependent variable (Performance of projects) to establish whether the independent variable influences project performance. The findings of this determination as summarized in tables (4.24, 4.25, and 4.26) and regression analysis clearly show a strong relationship existed between independent and dependent variable. The results also indicated that as much as change agent role was a determinant of the performance of water resources projects, it had the least influence on performance.

In this study; coordination, change agent, conflict resolution and monitoring, all had some influence on the performance of water projects. It was clear from the findings that coordination role and monitoring role had the highest influence on the performance of water projects. Leaders are therefore encouraged to be the critical link especially between project teams and the project stakeholders.

Further, leaders have to act as the bond that ties the project team together since the project teams often comprises of individuals from diverse cultural background, ethnicity, and education levels yet the team must work together to achieve a common project objective under tight schedules. Monitoring was very crucial and leaders have to monitor resource utilization, schedule and cost of the project in order for the projects to realise their objectives. Water projects in Kwale County are mostly funded by private sector in partnership with the county government and hence the need for close monitoring to ensure nothing is wasted or mismanaged. The study indicated that those projects that were closely monitored and reports on performance being reviewed periodically achieved high performance and were equally the most successful in meeting expectations of all stakeholders.

V. RECOMMENDATIONS

The study justifies that for projects to perform better, leaders need to provide proper coordination within project teams. At the same time leaders must be able to continuously monitor the progress of activities in projects. This way they can determine whether their projects are performing or not by measuring their performance against set criteria’s for success as well as providing corrective action where a deviation occurs. Another recommendation for leaders is on effective communication. From the study, it is evident that proper coordination goes hand in hand with effective communication. As a result leaders must learn to enhance their communication skills in order to lead their teams effectively.

As much as change is inevitable in projects, the study recommends that leaders should provide an environment where all team members in a project environment be part of the change. The aspect of change management needs to be a shared responsibility among project team members. This will provide an environment where everyone feels to be part of the change and therefore they will easily embrace and accommodate changes when they occur.

Project leaders should not show any form of bias when resolving conflicts within project teams. In case the conflict creates a positive vibe among team members as a leader you should encourage it for the good of the project. Further, the study recommends that a project leader be flexible in choosing a conflict resolution strategy that qualifies for the nature of conflict that occurs and the circumstances under which the conflict may be resolved.

Finally, the aspect of monitoring project activities is crucial for the success of the project being implemented. It is therefore recommended that leaders keep track and document all activities and progress of the water resources projects. This will enable leaders to plan in advance for any deviations that may occur late in project execution stage. The monitoring activities will need to start early in the project cycle phases and be performed until when the project is terminated.

REFERENCES


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Study of Growth of *Vigna radiata* due to polluted water of Shiv Ganga

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**Abstract** - The present work is an attempt to analyse various morphological development of *Vigna radiata* due to the effect of Shiv ganja water of Deoghar, Jharkhand. Water is one of the most important natural resources without which life on earth cannot be imagined. Irrigation of agricultural lands about 70% of the water used worldwide. Water contains substances necessary for the metabolism and photosynthesis in plants, including micro and macro-nutrients. Future agricultural development strategies of most of these countries depend on the other possibility of water for irrigation, mainly waste water. Nutrients present in waste water directly influence the growth of plant. In the present study we have studied the plant growth and development of *Vigna radiata* due to the effect of Shiv ganja water. Because vermilion deposition done by pilgrims, which contain many heavy metals, through which Shiv ganja get polluted. We used different concentrations of sample to better understand their response towards specific morphological development of *Vigna radiata*. Maximum growth of most these morphologies were found at 40% sample concentration as compared to control. Nonetheless, 60% sample concentration contains optimum micro and micro-nutrients which are useful for better growth of *Vigna radiata*. Moreover, we found that growth of *Vigna radiata* first increased with increased in concentration and then decreased with increased in effluent concentrations. At higher concentrations (80% - 100%) development of crop is significantly diminished suggesting certain constituents in polluted water are present excess than their tolerance limit.

**Index Terms** - Development, Shiv ganja, Morphology, *Vigna radiata*, vermilion.

I. INTRODUCTION

Water is one of the most important natural resources without which life on earth/planet cannot be imagined. We depend upon water for drinking, washing, bathing, irrigation, industries, domestic needs, farming, shipping, sanitation, and disposal wastages. Water bodies like ponds, rivers, impoundment, lakes etc came being in different ways and at different times. Heavy metals pollution is a wide spread problem in all parts of the world and it present in higher amounts these element are highly toxic and harmful for all organism. (Nagayotji, Lee et al. 2010). Microorganism could be used for migration of different types of heavy metal pollutants through the process of bioremediation(Chibuike and Obiora 2014). The comparative studies of Central Pollution Control Board of India (CPCB) on wastewater generation, collection and treatment indicates that the quantity has increased from 7,007 million liters day”*(ML/d)* in 1978-79 to 16,622 ML/d in 1994-95 in class I cities. However, the treatment capacity has increased only from 2755.94 ML/d in 1978-79 to 4037.20ML/d in 1994-95. Nowadays wastewater is frequently use in irrigation to decrease the pollution level.(Hussain, Raschid et al. 2002; Khaleel, Ismail et al. 2013). Wastewater is full of nutrients required for crop growth. So can be used as liquid fertilizer, by this way cost of fertilized can be reduced. For improvement of plant growth artificial fertilizers are used which provide essential nutrients.(Liu, Ren et al. 2011; Liu, Sung et al. 2014) (Hussain, Raschid et al. 2002; Khaleel, Ismail et al. 2013). Moreover, use of fertilizer increase the rate of crop production. Artificial fertilizer inhibits soil fertility when used in larger amount. (Savci 2012; Savci 2012). One of the main reasons of water pollution in India is near holy place. In present work the area of investigation is Deoghar, which is a holy city located in Jharkhand state. Here in the month of Sawan (June to July) millions of pilgrims used to came due to Baidyananthdham temple. Near the temple there is a holy river called Shive Ganga which is get polluted due to excessive discharge of sindur (Vermilion) and other discharge of pollutant by pilgrims. One of the most advantageous factors behind the use of wastewater in irrigation is the presence of desirable nutrients (Hussain, Raschid et al. 2002). However, types of nutrients and their requirement substantially differ for specific crop developmental growth (H anchang 2009; Rana, Singh et al. 2014).

Moreover, type of wastewater which depends on the strategies used while treatment of wastewater such as untreated or partially treated, also affect the concentration of nutrients (Chauhan 2016). Despite important nutrients, wastewater also contains several undesirable components which often toxic for plant growth. It has been reported that certain micro and macro-nutrients at lower concentration is beneficial however their higher concentration is lethal for crop growth (Yadav 2010; Barakat 2011; Chibuike and Obiora 2014; Yu, Li et al. 2014). In this study we have investigated the effect of Shiv ganja on different morphological development of *Vigna radiata*. We examined their different concentrations (0% - 100%) effect on various developmental stages of *Vigna radiata*.

**MATERIALS AND METHODS**

Shiv Ganga Shiv Ganga water was collected at regular interval of four months from the Deoghar Jharkhand, India. Different concentrations 0%, 20%, 40%, 60%, 80% and 100% of sample were prepared with distilled water. Distilled water was used as

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control (0%) and 100% Shiv Ganga water concentration was used as crude. To study the effect of Shiv Ganga water sample concentrations on growth of different morphologies of *Vigna radiate* pot study experiment was done. After post flowering stage different morphologies such as and were analyzed. Quadruplicate pots study were done. Meter scales were used to measure the length and width of respective morphologies and the number was counted and scored. All data were expressed with mean values and the corresponding standard deviations (SD).

### Table 1. Study of growth of different parts of *Vigna radiate* at different concentrations of Shiv ganga water sample.

<table>
<thead>
<tr>
<th>Shiv ganga water sample concentration</th>
<th>Plant length (cm)</th>
<th>Root length (cm)</th>
<th>Total number of stem</th>
<th>Total number of branch</th>
<th>Total number of nodule</th>
<th>Total number of flower</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>24.04 ± 1.16</td>
<td>14.14±1.08</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>20%</td>
<td>21.14 ± 1.4</td>
<td>9.60±0.02</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>40%</td>
<td>24.67± 1.96</td>
<td>9.26 ± 0.5</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>60%</td>
<td>19.65± 1.82</td>
<td>4.94 ± 0.71</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>80%</td>
<td>13.5 ± 0.50</td>
<td>3.04 ± 0.63</td>
<td>1</td>
<td>6</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>100%</td>
<td>9.47 ± 1.01</td>
<td>2.96 ± 0.86</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
</tbody>
</table>

### I. RESULTS

To study the specific response of different concentrations of Shiv Ganga polluted water we systematically examined the several morphological development of plant. We examined the effect of different sample concentrations (0%, 20%, 40%, 60%, 80% and 100%) on the length of root and shoot, total number of nodule, stem, branch, leaf, flower and length and width of leaf. After post flowering stage all the morphologies were examined.

**Plant length:** Whole length of plant was found maximum at 40% sample concentration (24.67 cm) and it was found to be similar at control (24.04 cm) (table 1). Moreover, plant length was higher at 20% and 60%, as 21.14 cm and 19.65 respectively. Length decreased at 80% and 100% concentrations as compared to control as 13.5 cm and 9.47 cm. The pattern of plant growth at various concentrations represent 0% and 40% concentrations are optimum and all other concentrations can decrease the plant length.

**Root length:** Results show that at different concentrations of water sample length of root were different. The length of root was decreased at higher tested concentrations and maximum length of root was found to be 9.60 cm at 20% concentration of sample (table 1). Moreover length of root was 9.26 at 40%, 4.94 at 60%, 3.04 at 80% and 2.96 cm at 100% effluent concentrations. According to result 20% - 60% effluent concentrations are suitable for root development and higher concentrations (80% - 100%) of sample water decreased the root development as compared to control.

**Total number stem:** Results show that total number of stem increased at 20% concentration as compared to the control (table 1). The total number of nodules was 4 at 20% concentration and 2 at control. However stem number decreased with increased in concentration. At 40% effluent concentration number of stem was same as 60% control and that was 3. At 80% effluent concentration number of stem was same 100% concentration it remain 1.

**Total number of branch:** Development of branch was found maximum at 60% concentration (table 1). At 60% concentration total 8 branches were developed however total number of branch was 5 at control. We found that number of branch initially increased with increased in the concentrations. Moreover the number of branches was similar 6 at 20% and 80% concentration. The total number of branch was 7 at 40% concentrations. However their development further decreased at 100% concentration become 2. The obtained result suggesting that 60% concentrations are more beneficial for branch growth compared to control.

**Total number of nodules:** Results show that number of nodule maximum at 40% concentration (table 1). The number of nodule at 40% concentration was 8. However the number of nodule was similar 6 at 20% and 60% and 100% concentration. Total number of nodule was 7 at 80%. However it was 5 at control. Effect of water sample on number of nodule was minor as compared to root and shoot development.

**Total number of flower:** Development of flower was found maximum at 60% concentration. At 60% concentration total 6 flowers was developed (table 1). However total number of flowers was similar 2 at control and 80% concentration. We found that number of flower decreased gradually with increased in the concentrations. The total number of flower was 5, 3 and 1 at 20%, 40% and 100% concentrations respectively. The obtained result suggesting that 20% to 60% concentrations are more beneficial for flower development as compared to control.

**Total number of leaf:** Growth of leaf of *Vigna radiate* most briefly explained the effect of water. Results show that the maximum number of leaves was at 60% and 20% concentration (table 2). The total number of leaves was 50 at 60% and 49 at 20% concentration. However number of leaf was 35 at control and increased gradually with increased in the concentrations till 60%. The total number of leaf was 46 at 40% concentration. However it gradually decreased 43 and 16 at 80% and 100% concentrations respectively. These results indicate that 20% to 60% concentrations are suitable for leaf development as
compared to control. However use of crude sample 100% concentrated sample can inhibit the leaf development. **Leaf length:** Effect of water sample on leaf growth (length and width) was not following the sample pattern as root and shoot development. However maximum length of leaves were found to be at 80% and 100% as compared to control and other tested sample concentrations (table 2). The length of leaves at 80% and 100% sample concentration were 9.19 and 8.38 cm respectively. Though the length of leaves was decreased at 20% and 40% concentration as 4.34 and 4.31 respectively. It almost remains similar at control and 60% concentration. The length at control and 60% concentrations were 7.7 and 7.02 respectively.

### Table 2. . Study of leaf growth of *Vigna radiate* at different concentrations of Shiv ganga water sample.

<table>
<thead>
<tr>
<th>Shiv ganga water sample Concentration</th>
<th>Total number of leaf</th>
<th>Leaf length (cm)</th>
<th>Leaf width (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>35</td>
<td>7.7 ± 0.23</td>
<td>7.76 ± 0.32</td>
</tr>
<tr>
<td>20%</td>
<td>49</td>
<td>4.34 ± 0.41</td>
<td>7.75±0.38</td>
</tr>
<tr>
<td>40%</td>
<td>46</td>
<td>4.31±0.27</td>
<td>7.84±0.21</td>
</tr>
<tr>
<td>60%</td>
<td>50</td>
<td>7.02±0.17</td>
<td>9.93±0.48</td>
</tr>
<tr>
<td>80%</td>
<td>43</td>
<td>9.19±0.21</td>
<td>8.47±0.49</td>
</tr>
<tr>
<td>100%</td>
<td>16</td>
<td>8.38±0.51</td>
<td>7.83±0.43</td>
</tr>
</tbody>
</table>

**Leaf width:** Effect of water sample on leaf width was following the sample pattern as root and shoot development. However maximum length of leaves was found to be 9.93 cm at 60% concentration (table 2). After that the width of leaves gradually decreased at 80% and 100% sample concentration as 8.47 and 7.83 cm respectively. Though the width of leaves were almost remains similar at control, 20% and 40% concentration as 7.76 cm, 7.75 cm and 7.84 cm respectively. The obtained result suggesting that there is no correlation between the growth of length of leaf and width of leaf.

### DISCUSSION

In the present study we have studied the plant growth and development of *Vigna radiata* due to the effect of Shiv ganga water . Shiv Ganga river flow region is in Deoghar, Jharkhand and in nearby area its water is used in agriculture. The water quality used for irrigation is essential for the yield and quantity of crops, maintenance of soil productivity, and protection of the environment. Water is full of nutrients required for crop growth. So can be used as liquid fertilizer, by this way cost of fertilized can be reduced. Future agricultural development strategies of most of these countries depend on the possibility to maintain, improve and expand irrigated agriculture. Though, this strategy is beneficial for certain crop. Although optimum concentration which can be used in irrigation for specific plant such as *Vigna radiate* have to be investigated. We used different concentrations of sample to better understand their response towards specific morphological development of *Vigna radiata*. We grow the plant in the presence of different concentrations of sample (0%, 20%, 40%, 60%, 80%,100%). Moreover, analysis of suitable concentration Shiv Ganga water sample for better crop growth could economize the agriculture methods. We analyzed the effect of water sample on length of root and shoot, length- width of leaf. We calculated total number of nodule, stem, branch, leaf and flower after post flowering stage. Maximum growth of all these morphologies was found at 40% sample concentration as compared to control. Moreover, we found that development first increased with increased in concentration and then decreased with increased in effluent concentrations. Among all tested dilution the optimum concentrations of water sample were found to be 20% to 40% for root, shoot, leaf and nodule. For stem the optimum concentrations of water sample were found 20%. For branch, flower and leaf the optimum concentrations of water sample were found 20% to 60%. These results indicating that highest concentration contain excess nutrients or heavy metals which possibly inhibit the proper growth of different parts of plant of *Vigna radiata*. Thus, their lower concentrations are not sufficient to provide required amount of nutrient. Mid concentration are important and optimum for plant growth. Moreover their qualitative and quantitative analysis and investigation of their effect on different morphological parameters will be useful to select the optimum concentration of Shiv ganga water use in irrigation. Though, higher concentrations can lead to declination in the plant growth. Several studies have reported the toxic effects of excess nutrients and heavy metals on plant growth (Yadav 2010; Barakat 2011; Chibuike and Obiora 2014; Yu, Li et al. 2014). Physico-chemical analysis will be required to investigate the presence of specific nutrients and heavy metals in Shiv ganga water sample.

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Impact of Demonetization on Rural India

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Abstract- According to investopedia Demonetization means the act of stripping a currency unit of its status as legal tender. There are multiple reasons why nations demonetize their local units of currency. Some reasons include to brush-off inflation, to brush-off corruption, and to dispirit a cash system. The process of demonetization involves either introducing new notes of the same currency or completely replacing the old currency with new currency. Indian government adopted demonetization on 08 November 2016 to tackle with black money and make India a cashless digital economy. As per the yearly report of Reserve Bank of India of 31 March 2016 that total currency notes in circulation is 16.42 lac crore of old Rs. 500 and Rs.1000 banknotes. As per the report of RBI dated on 14-12-2016, the total amount of old notes of value of Rs. 12.44 lac crore has been deposited by the customers till 10-12-2016. Banks started accepting deposits from 10 November but within a period of 15 days approximately half money has been received by the banks.

Index Terms- Demonetization, Cashless Transactions, Cash Crunch, Digital Economy.

I. INTRODUCTION

The ‘demon’ in demonetization is in the beginning. Any Government withdraws the legal tender rights of any denomination of currency, it is known as demonetization. On November 8, Indian Prime Minister Mr. Narandar Modi announced in a broadcast to the nation that Rs. 500 and Rs. 1000 currency notes would no longer be recognized legally as currency. The total currency in circulation in India was Rs. 16.42 lac crore (US$240 billion) of Rs. 1000 and Rs. 500 notes. The government believe that this demonetization is required for the four main reasons first reason is for stopping the funding of terrorism, second reason for facing the problem of fake Currency, Third reason for making the black money worthless and fourth reason for reducing the corruption, etc. The need for the government to keep the move a secret because the tax evaders would not be aware before the announcement of demonetization took place. For Modi, this is work in progress. In his speech to the nation, he highlighted what his government has done so far. Narandar Modi has prompted it will take 50 days for people to adjust to the change. This announcement appears to be the most important change made by the Narandar Modi’s government to date, says Girish Vanvari, partner and head KPMG in India. A decision like this can result in the sweeping up of a system for which many trust that it could not be done, as earlier attempts did not have rich impact. However, the decision by Prime Minister Mr. Narandar Modi is one the most historical steps in India. A decision like this can help control inflation, recapitalise banks, minimizing the interest rates and making the economy vibrant, with capital inflows. India is the second most populated country in the world with nearly a fifth of the world's population. Out of the total 121 crore Indians of Indian population, 83.3 crore of population live in rural areas whereas 37.7 crore stay in urban areas, said the Census of India 2011. As a rural populated country most of the rural population are engaged in agricultural activities as most of the population of rural areas depends on agriculture. Agriculture forms the backbone of the country’s economy. The agricultural sector like forestry, logging and fishing accounted for 17% of the GDP contributes most to the overall economic development of India. It is the largest employment source and a important piece of the overall socio- economic development of India. The states of Uttar Pradesh, Punjab, Haryana, Madhya Pradesh, Andhra Pradesh, Telangana, Bihar, West Bengal, Gujarat and Maharashtra are key contributors to Indian agriculture.

OBJECTIVES OF PAPER

- To study the impact of demonetization on common person of India
- To study the impact of demonetization on agricultural sector and farmers of rural India.
- To study the impact of demonetization on economy of India.

RESEARCH METHODOLOGY

The paper is based on secondary data. The data has been collected from internet, articles newspapers etc. Graph and percentile method has been used to analyze the data.

Impact of demonetization on common person of India.

Demonetization is a generation’s memorable experience and is going to be one the economic events of our time. Its impact is felt by every Indian citizen. As the country says goodbye to the old Rs. 500 and Rs. 1,000 rupee notes and with restrictions on exchanging money and taxation on high amounts of deposits, Indian economy had faced through some serious churns. But how is this going to affect the common person of India in the short run as well as the long run. Initially, there was a huge hue and cry about the idea, people had to wait in really long queues just to withdraw the necessary money they needed. The public doubted prime minister’s plan and revolted against the bad preparation they faced in this regard. The changes did invite a lot of trouble to the public in the beginning but it all seemed worth that, as far as the long-term effects were concerned. There was a limit to the per-capita withdrawal and that was a huge issue for many people, mainly because of their personal requirements which included marriage, health, property etc. In the process of curbing black money the innocent common people and poor had seemed most suffered like, those people who do not have access to post offices and banks had seemed panicking for exchanging...
notes. Those families who had weddings and other special occasions are depressed due to lack of money. Thousands of weddings have been cancelled which impacted the vendors who supply for those weddings. Also, farmers have faced lot of problems because they could no longer afford to sell their harvest from Kharif crop or sow Rabi crops. Also Many street vendors have loosened their business because do not want to part with cash or cannot make change. People have cut back spending because the banks are rationing cash. Many Daily wage workers are unable to find work. Also Demonetization has a direct impact on sectors dealing with cash—vendors, auto rickshaw owners, taxi drivers, daily wage earners and small traders. The Indian system mainly functions on cash, and so, less cash means disruption in the flow. Therefore, the government's step to curb black money and fake currency has hit hard to poor people the most. But as the time passed the things slowed down a bit. The queues in the banks shortened, ATMs were filled with money, new currency circulated and all these normalized the situation. Nevertheless, this change will have a huge impact on the economy. It will take some time for things to become normal again and for now, it is just a play of time till we get to know whether it was a really good decision or an overrated implication.

The demonetization of Indian currency has created numerous hardships to common person but in long way it has lot of advantages.

1. To the extent of penalties imposed by the Income Tax department on the illegal conversion of black money into white money, the revenue to the government will increase in the immediate future.

2. Unaccounted monies held as cash which was not productive will become productive as it enters the legal system.

3. Counterfeit money in circulation which was an ongoing menace all over India will cease to exist with immediate effect.

4. Funding of terrorist and other illegal activities will be curtailed as they generally are funded by black/counterfeit money.

5. To the extent the black money held by the political parties is flushed out, the elections in the near future will be clear and more transparent.

6. With huge cash at the disposal of the banks, the borrowing of money will get cheaper providing impetus to economic growth.

7. Government can avail finances at lower rates and speed up the infrastructural spending creating huge job opportunities.

So far, it can be said that this is a historical step and must be supported by everyone. We should look at the bigger picture which will definitely fetch results in the future. This is what the whole country has been asking for a long time which has finally happened.

The impact of demonetization on agricultural sector and farmers of rural India:

Agriculture plays an important role in the Indian economy. Over 70% of the rural households depend on agriculture. Agriculture is the backbone of Indian economy as it contributes about 17% to the total GDP and provides employment to over 60% of the population. It also provides raw materials to leading industries such as cotton textiles and sugar industries. The number of various agricultural commodities like tea, coffee, spices and tobacco constitutes our main items of exports. This amounts to almost 15% of India’s total exports. Hence agriculture provides foreign exchange which helps us to purchase machines from abroad. It also maintains a balance of payments and makes our country self-sufficient. Agriculture has brought fame to the country. India holds first position in the world for the production of tea and groundnuts, Indian agriculture has registered speedy growth over last few decades.

The following graph shows GDP from Agriculture of India
exhaustive. However, the limit has been exceeded than before and government is taking other necessary formalities which would ensure that the farmer does not have to commit suicide. If the income of peon working in government services and farmers of our country is compared since 1964, the income of peon has increased 1000 % and that of farmers by meagre 19%. Besides those negative effects of demonetization there is also hope of every Indian farmer upon demonetization that this historical step will concrete our economy and also fruitful for our country in future.

The various effect of the Demonetisation would be very positive for farmers are:
- With plentiful money, the government become able to complete the incomplete irrigation projects so that more land comes under irrigation and two crops instead of one crop in a season can be taken by farmers. This will double up their income as our Prime Minister Mr Narandar Modi has promised to do.
- The interest rates of banks started falling which could reduce the capital cost and farmers can now go for farm mechanisation.
- Government can build cold storage chain thereby minimize the wastage which are 80, 000 cr annually.
- The intermediaries and commission agents blooming on black money will be minimized and farmers can directly deal with consumers and they can credit instant payments to their bank account.
- The owners of essential commodities like pulses, grains, potatoes onion etc will run out of cash and will not be able to rig the prices. The farmers and also consumers will be benefitted as the price would remain stable.
- The quality of fertilizers will improve in that the nutrients contents will not be depreciated.
- The Government can conclude the pending electricity generating projects so that the farmers who are suffering by lack of proper electricity will get more electricity so that he can run their drip irrigation system and save water.
- The national portal made for farmers of the country will be more effective as the farmers will have wider market instead of local and District mandies. They will get more prices for their production with payment directly in their bank accounts.
- Farming becomes more viable and there will be reverse migration to villages from cities. The smart phone holder children of farmers will not now shy from working on farm in future.

The impact of demonetization on economy of India:

India has a mixed economy. The economy of India is the sixth-largest economy in the world measured by nominal G.D.P and also the third-largest by purchasing power parity. The country is knowing as a newly industrialised country, as one of the G-20 major economies, a member of BRICS and a developing economy with an average growth rate of approximately 7% over the last two decades.

The World Bank has predicted the GDP growth rate of 8% for India by 2017 and said that a strong expansion in the country, coupled with favourable oil prices, would accelerate the economic growth in South Asia. In India, GDP growth is expected to accelerate to 7.5 per cent in fiscal year 2015/16. It could reach 8 per cent in FY 2017/18, on the back of significant acceleration of investment growth to 12 per cent during FY 2016-FY 2018, Indian economy is the fastest growing economies among all emerging nations. At the same time, India’s economy is very much sensitive to any uncertainties that happen in the world. On 8th November 2016 Narendra Modi banned the circulation of Rs. 500 and Rs. 1000 currency notes to curb black money in India, it will definitely affect Indian economy in near future. In the short run, people will face some difficulty in getting cash as trading of high-value notes is banned and a limit imposed by government on withdrawal of the cash from the ATM and banks. This will reduce liquid cash with people and they will start consuming less. As Indian GDP is consumption driven, demonetization will impact GDP of the country for next one or two quarters People owing black money will deposit their cash in banks. So the liquidity with banks will increase and they can lend more money in the market. The supply of money in the market will definitely increase and hence interest rates will reduce which will boost investment in the country. As the investment will increase obviously production of goods and services will rise, which will lead to growth in the employment in the country and hence income of the people will definitely increase. As the disposable income of people will increase, consumption of the goods and services will also increase which will ultimately increase GDP of the country. Another positive impact of demonetization is those people who are depositing their black money in the banks have to pay taxes to the government which will lead to increase in government savings. The government can use these savings for further investments (government spending) and hence increase in GDP.

II. CONCLUSION

Demonetization is a one step of many steps in fighting corruption, black marketing, and financing insurgency. However preparation for demonetization was lop-sided, and its impacts was terrible on Indian public. If 86% of cash is taken out, with a meagre amount available, all market transactions have been killed. The people, who were targeted, did not come on streets, but common folk are out from their work places as well as homes. , Somebody put a parable on social net. For killing ten
crocodiles, government pumped out all water from the pond results killing ten thousand fish in pond but Crocodiles walked off on dry sand. With an intention to rid the country of black money and dig out tax defaulters and black money holders, government has taken step to demonetized Rs 500 and Rs 1000 notes. This move will have major impact on the parallel economy but sudden announcement and failure to prepare in advance has created temporary chaos and discomfort among the general public. Common Men are finding it difficult to buy with no money in pocket, wasting hours in queues which although could have been avoided if planned in advance.

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Impact of the Management of the School Community Relationship on Students’ Academic Performance

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Abstract- Schools exist in the heart of each community and school-community links are beneficial. The purpose of this study was to investigate the influence of school -community relationship on students’ academic performance. The study adopted a mixed methods approach and a descriptive survey design. Using purposive and simple random sampling techniques, a sample size of 44 principals, 369 class teachers and 369 class prefects was selected to participate in this study, giving a sample size of 782 respondents. Data was collected by administering a likert scale questionnaire and an interview schedule. Quantitative data was analyzed using descriptive statistics of frequencies, percentages, means and standard deviation. Qualitative data was analyzed by describing emerging content from the respondents in relation to the study objectives. The study established that, communication skills influence teaching and learning. From the results it is concluded that academic performance could be improved if school relationship was enhanced. The following recommendation was made: Education stake holders should actively participate in the running of schools by providing material and administrative support.

Index Terms- School, community, relationship, Academic performance

I. INTRODUCTION

A school’s community refers to the various individuals, groups, businesses and institutions that are interested in the welfare and vitality of a school and form the neighbourhoods served by the school. It encompasses the school administrators, teachers and staff members who work in a school; the students who attend the school and their parents and families; and local residents and organizations that have a stake in the school’s success, such as school board members, city officials, and elected representatives; businesses, organizations, and cultural institutions; and related organizations and groups such as parent-teacher associations, booster clubs, charitable foundations, and voluntary school improvement committees. The School community concept is closely related to the concept of voice and shared leadership which generally seek to broaden the involvement of more individuals and diverse view in the governance and programming in the school (http://edglossary.org/school-community/).

Sergiovanni (1994) asserts that community building is important in schools because it is the tie that binds students and teachers together in a special way to something more significant than themselves. It lifts both teachers and students to higher levels of self-understanding, commitment, and performance beyond the reach of the shortcomings and difficulties they face in their everyday lives. "Community can help teachers and students be transformed from a collective of “I” to a collection ‘we’, thus providing them with a unique and enduring sense of identity, belonging, and place” (p. 15). Community building must become the heart of any school improvement effort. Whatever else is involved in improving teaching, developing sensible curriculum, creating new forms of governance, providing more authentic assessment, empowering teachers and parents, and increasing professionalism must rest on a foundation of community building. Successful community building depends in large measure on each individual school defining for its own life and creating for itself its own practice of schooling. This inside-out strategy requires a considerable amount of searching and reflection as teachers struggle with such issues as who they are, what they hope to become for the students they serve, and how they will decide, organize, teach, learn, and live together (Sergiovanni, 1994).

Schools exist in the heart of each community and school-community links are beneficial. The principal can play a leading role in fostering these links. A school is a social institution responsible for promoting social interests and it is the responsibility of communities to look after the school in terms of buildings and furniture, providing direction, in recruiting volunteers to help at school functions, in mentorship functions and a sense of stability. Parents' involvement in the education of their children is associated with student motivation. The principal and the faculty of the school should find methods and techniques to establish rapport with parents and guardians of the students. Spencer, Nolan, Ford and Rochester (1989) highlight that schools were formed by a society, within society and for society so that through its children, society will retain its identity and viability. According to Spencer et al. (1989), school enhances interaction between a society’s communities and its teaching-learning institutions. Hence, effective education is a function of community and school interaction. According to Onyango (2001), the principal should possess a thorough knowledge of the community by being the centre of the community activities and seek to foster a good working relationship with the Board of Management (BoM) and Parents Teachers Association (PTA) which are important links between the school and community. The principal should also co-operate with other agencies in the community that render important services to the school.

Henderson and Berla (2004) and Ubogu (2004) argue that the most accurate predictor of a student’s achievement in the school is the extent to which the student’s family creates the home environment that encourages learning, expresses high
realistic expectations and is involved in their children’s education at home and in the community. A three year study by Steinberg (2006) involving 12000 students in nine high schools in the US reveals that community involvement draws parents into the school physically and are most effective in improving academic achievement through attending school programs, extra curricula activities and ‘back to school’ nights. Steinberg(2006) concludes that when parents come to school regularly, it reinforces the view in the child’s mind that school and home are connected and that school is an integral part of the whole family’s life. Ubogu (2004) further indicates that parents’ interaction with teachers enables them to know what their children are encountering in school and what could be done to deal with any problems that could be experienced. He also says that the students should be put on alert and study in school as they would know their parents would inquire about their performance. Parents may not be able to provide much guidance and help their children’s performance to improve when they are ignorant of what happens in school. It is therefore only through an ongoing dialogue between the school and its surrounding community culture that the school can construct its open, twofold role as both recipient and provider of education.

Gershberg and Winkler (2004) say that instructional problems can be addressed through parental and community involvement in school activities. They further observe that greater parental and community control of schools lead to higher teacher and student attendance and higher performance. Studies in Argentina, Brazil, Elsalvador, Nicaragua, Honduras, Mexico Nigeria, Peru and a number of Indian states link reduced absenteeism to parental community or school leader involvement and supervision (Gershberg and Winkler 2004). Community based factors are therefore factors within the community that principals should maintain to enhance a learner’s academic performance.

II. RESEARCH DESIGN AND METHODOLOGY

This study adopted a concurrent mixed methods approach and its research design was descriptive survey. Orodu (2003) and Fraenkel and Wallen (1993) describe descriptive survey as a method of collecting information by interviewing or administering a questionnaire to a sample of individuals. A survey, according to Kodhari (2003), is a method of securing information concerning an existing phenomenon from all or a selected number of respondents of the concerned universe. From the sample results the researcher generalizes or makes claims about the population (Cresswell, 2003). The study was descriptive because it looked at school community relationship that already existed. Class teachers and class prefects of Form I-IV each responded to a questionnaire and the principals were interviewed to get their views on the role of curriculum practices on teaching and learning. However, Kodhari (2003) says the main weakness of descriptive survey is that it may give low response rates especially in mailed questionnaire. The target population was 175 principals, 1433 class teachers and 2865 class prefects of the 175 sub-county secondary schools. The sample size selected for this research from the study population was 782. Using purposive and simple random sampling, a sample of 44 principals, 369 class prefects and 369 class teachers was chosen to participate in the study as respondents.

This study used questionnaires and interview schedules to elicit responses from the study subjects. The questionnaire titled class teachers and class prefects was used to gather data for this study. Interviews were scheduled for the principal to get qualitative data. Gay (1992) maintains that questionnaires give respondents freedom to express their views and their opinions and also make suggestions. According to Nzubuga (2000), qualitative data gives the researcher much information and helps them identify significant factors to measure.

The researcher conducted a pilot study in the neighbouring county using 2 schools to establish reliability of research instruments through the test re-test method. To validate the research instruments the researcher used the technique of content validity which showed whether the test items represented the content that the test intended to measure (Borg and Gall, 1989). Content validity ensured that the instruments covered all the areas to be examined. Two supervisors from the department of curriculum, instruction and Educational Media, and colleagues, Moi University scrutinized the instruments and made necessary adjustments so that the instruments were adequate and able to elicit adequate data. Validity was also further ascertained through the results of the pilot study.

Descriptive statistics was used to analyse data. Results from quantitative data were presented by use of percentages means and standard deviations, while qualitative data were recorded, grouped in themes and findings reported. Data were analysed using Statistical Package for Social Sciences (SPSS v. 20) for easy interpretation.

III. RESULTS AND DISCUSSIONS

The objective of this study was to explore the impact of maintenance of school-community relationship on teaching and learning. To achieve this objective, respondents were asked to respond to several statements concerning the maintenance of school community relationship on teaching and learning. The results are indicated in table 1.

The findings in table 1 shows that 48.3% of the class teachers rejected the statement that most of the professional development teachers have received comes from sources outside the school system, 4.6% of the class teachers were undecided and 47.2% of the class teachers supported the statement. The results show that majority of the teachers in the studied schools do not get professional development support from sources outside the school. These findings could be indicating that communities surrounding these schools do not actively participate in the training of teachers. This concurs with data collected from the qualitative study when majority of the principals said they had not received any support from the community to go for some training. Regarding the statement that my school system is supportive of teachers and students working with outside sources, 33.1% of the class teachers and 38.8% of the class prefects rejected it, 5.7% of the class teachers and 15.2% of the class prefects were undecided, while 61.2% of the class teachers and 46.1% of the class prefects supported the statement. The findings indicate that majority of the schools’ administration allows and supports teachers and students
working and interacting freely with the community. All the principals interviewed in the qualitative study said that their teachers and students, and the school-community relationship is good because they actively participated in community activities such as funeral, wedding harambee and environmental cleaning and parents frequently visited the schools. Handerson and Berla (2004) argue that when parents are involved in their children’s education at home they do better in school. A three year study by Steinberg (2006) involving 12,000 students in nine high schools in the US reveals that community involvement draws parents into the schools physically and are most effective in improving academic achievement through attending school programs, extra curricular activities, conferences and ‘back to school’ nights. Steinberg concludes that when parents come to school regularly, it reinforces the view in the child’s mind that school and home are connected and that the school is an integral part of the whole family’s life. Reche et al. (2012) and Ubogu (2004) say that good performance is realized when parents work in consultation with the teachers in order to understand their children better. They continue to say that parents’ interaction with teachers enables them to know what could be done to deal with the problems. It would also put pupils on alert and study in school as they would know that their parents would inquire about their performance.

We have received resources to support our learning from sources outside our school. This statement was rejected by 40.6% of the class teachers and 32.8% of the class prefects. 5.1% of the class teachers and 12.5% of the class prefects were undecided. 54.3% of the class teachers and 54.7% of the class prefects accepted the statement. The findings indicate that majority of the teachers and students get teaching and learning resources from the community. Ubogu (2004) says that schools where parents are involved in school development do better in examinations as pupils are encouraged both by the teachers and the parents. Hence effective education is a function of community and school interaction.

The statement that I am influenced by organizations outside my school was rejected by 40.1% of the class teachers and 32.8% of the class prefects. 5.7% of the class teachers and 14.9% of the class prefects were undecided. 54.2% of the class teachers and 52.3% of the class prefects agreed with the statement. These results indicate that majority of the teachers and students in the sampled schools are influenced by activities from the community. Ubogu (2004) says that schools where parents are involved in school development do better in examinations as pupils are encouraged both by the teachers and the parents. Hence effective education is a function of community and school interaction.

Mean and Standard deviation scores for maintenance of school-community relationship

The results in table 2 below indicate that the perception of the class teachers and class prefects on the maintenance of school-community relationship are in the Disagree and undecided range (mean between 2.11 and 3.26). The total mean and standard deviation for the class teachers and class prefects is (mean = 2.86, SD=1.403) and (mean=3.15, SD=1.359) respectively, giving an average mean rate of 3.01. The class teachers ranked the maintenance of school-community relationship as; My school system is supportive of teachers and students working with outside sources (mean=3.30, SD=1.273), we have received resources to support our teaching from sources outside our school (mean=3.14, SD=1.310), most professional development I receive comes from sources outside of my school system (mean=2.90, SD=1.265) and I am influenced by organizations outside my school (mean=2.11, SD=1.762). The influence variables with the highest mean: My school system is supportive of teachers and students working with outside sources with a mean of 3.30 and we have received resources to support our teaching from sources outside our school with a mean of 3.14 have the effect of making the school an open system where by it receives inputs from the community and discharges its outputs into the community.
Table 1: Analysis of the views of respondents on maintenance of school-community relationship on teaching and learning

<table>
<thead>
<tr>
<th>Statement</th>
<th>Respondent</th>
<th>SD</th>
<th>D</th>
<th>UD</th>
<th>A</th>
<th>SA</th>
<th>TOTAL</th>
<th>MEAN RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most professional development I have received comes from sources outside</td>
<td>C.TRS</td>
<td>73</td>
<td>19.8</td>
<td>105</td>
<td>28.5</td>
<td>17</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>My school system is supportive of teachers and students working with</td>
<td>C.TRS</td>
<td>46</td>
<td>12.5</td>
<td>76</td>
<td>20.6</td>
<td>21</td>
<td>5.7</td>
<td>3.30</td>
</tr>
<tr>
<td>outside sources</td>
<td>C.PRE</td>
<td>74</td>
<td>20.1</td>
<td>69</td>
<td>18.7</td>
<td>56</td>
<td>15.2</td>
<td>3.01</td>
</tr>
<tr>
<td>We’ve received resources to support our teaching and learning from</td>
<td>C.TRS</td>
<td>47</td>
<td>12.7</td>
<td>103</td>
<td>27.9</td>
<td>19</td>
<td>5.1</td>
<td>3.14</td>
</tr>
<tr>
<td>outside our school</td>
<td>C.PRE</td>
<td>61</td>
<td>16.5</td>
<td>60</td>
<td>16.3</td>
<td>46</td>
<td>12.5</td>
<td>3.26</td>
</tr>
<tr>
<td>I am influenced by organizations outside my school</td>
<td>C.TRS</td>
<td>64</td>
<td>17.3</td>
<td>84</td>
<td>22.8</td>
<td>21</td>
<td>5.7</td>
<td>2.11</td>
</tr>
<tr>
<td></td>
<td>C.PRE</td>
<td>56</td>
<td>15.2</td>
<td>65</td>
<td>17.6</td>
<td>55</td>
<td>14.9</td>
<td>3.19</td>
</tr>
</tbody>
</table>

The response categories were: 1=strongly Disagree, 2 = Disagree, 3=Undecided, 4 = Agree and 5=strongly Agree.

Table 2: Mean and Standard deviation scores for maintenance of school-community relationship

<table>
<thead>
<tr>
<th>School-community relationship</th>
<th>Class Teachers</th>
<th>Rank</th>
<th>Mean</th>
<th>StdDev</th>
<th>Class Prefects</th>
<th>Rank</th>
<th>Mean</th>
<th>StdDev</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most professional development I receive comes from sources outside my school system</td>
<td></td>
<td>3</td>
<td>2.90</td>
<td>1.265</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>My school system is supportive of teachers and students working with outside sources</td>
<td></td>
<td>1</td>
<td>3.30</td>
<td>1.273</td>
<td></td>
<td>3</td>
<td>3.01</td>
<td>1.377</td>
</tr>
<tr>
<td>We have received resources to support our teaching and learning from sources outside our school</td>
<td></td>
<td>2</td>
<td>3.14</td>
<td>1.310</td>
<td></td>
<td>1</td>
<td>3.26</td>
<td>1.386</td>
</tr>
</tbody>
</table>
I am influenced by organizations outside my school

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2.86</td>
<td>1.403</td>
<td>3.15</td>
<td>1.359</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>2.11</td>
<td>1.762</td>
<td>2</td>
</tr>
</tbody>
</table>
Sergiovanni (1994) says that it is only through an ongoing dialogue between the school and its surrounding community culture that the school can construct its open, two fold roles as both recipient and provider of education.

Schools scored the lowest mean on I am influenced by organizations outside my school with a mean of 2.11. Despite coming from the community as teachers and going back to the community as their home after school, teachers when at school teach using prescribed program in form of syllabus, meaning their educational activities are least affected by community activities. They do not entirely bring community life or culture into the school, but only incorporate relevant cultural elements so that after school the learner can fit into community life and be a useful member of society. Sarason (1982) argues “all educational scenes should not be sharply delineated within the walls of the school building but extent to their dynamic social surroundings” (p.18).

The class prefects ranked the maintenance of school-community relationship as; we have received resources to support our learning from sources outside our school (mean=3.26, SD=1.386), I am influenced by organizations outside of my school (mean=3.19, SD=1.313) and my school system is supportive of students working with outside sources (mean=3.01, SD=1.377). The influence variable with the highest mean was the receiving of resources to support learning in the school with a mean of 3.26 and variable with the lowest mean was the school system is supportive of students working with outside sources with a mean of 3.01. It could be concluded from this results that students receive learning resources from the community. Ubogu (2004)says that schools where parents are actively involved in school development do well in examinations as pupils are encouraged by both parents and teachers.

As regards the school system not being supportive of students working with outside sources fully, school could be being selective with the kind of aspects students should get in touch with to avoid incidences of students being influenced to be involved in bad behaviors such as drug abuse, theft, sexual abuse and destruction of school property.

According to the principals interviewed in the qualitative study, maintenance of school-community relationship has the impact as discussed below:

Question 18: What professional development have you received from the community?

Majority of the principals interviewed said that they had not received any professional development from the community. It is only a few of the principals who had been sponsored by the Catholic Church to go to Strathmore College for the Art of leadership training. All schools in the sample support teachers and students working with the outside sources through attending community funeral, harambee, wedding, keeping the environment clean, attending church services, community using school furniture, halls, water, buses, education days and annual general meetings. All the principals also said that they receive resources from the community such as food, building materials, labour and firewood. And generally according to the interviewed principals, school community relationships are good. It is a few of the principals who said that their relationship with the community is not good because local leaders have been fighting for their transfer because they are natives of the area.

The results therefore indicated generally that school-community relationship is cordial and supports teaching and learning. All the sample schools exist as an open system as they interact freely and receive resources from the community. Steinberg (2006) says that community involvement in the running of schools draw parents into the school physically and is most effective in improving academic achievement.

The fifth objective was to explore the impact of schools’ maintenance of good school-community relationship on teaching and learning. Based on this, the findings were that the perception of the class teachers and class prefects on the schools'maintenance of school-community relationship on teaching and learning had a mean of 2.86 and 3.15 respectively giving an average of 3.01, meaning that the sample of class teachers and class prefects perceived the schools' maintenance of school-community relationship to be average. According to the class teachers and class prefects, the strategies schools were using most to maintain school-community relationship were: schools promoted school-community relationship through creating a system that was supportive of teachers and students working with outside sources and receiving resources to supporting teaching and learning from the community and teachers and students interacting freely with the community.

As regards maintenance of school-community relationship, the mean perception was average; the correlation coefficient for class teachers was insignificant and significant for class prefects. The Chi-square results showed significant relationship between school-community relationship and teaching and learning. However the average perception and the low r values is indicating that most schools have not established school-community relationship thus affecting performance of schools in KCSE.

IV. RECOMENDATION

1. The local community to enhance teaching and learning by improving on their attendance of school functions, serving on school committees and providing teaching and learning resources.

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The Use of Force in International Relations

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Abstract- War is at the core of the efforts to submit the use of military force in international relations to legal rules. For millennia the decision to wage war was not subject to any legal restrictions. Furthermore, war was regarded as a legitimate means of policy, its foremost aim changing territorial boundaries. In the early years of the twentieth century, nearly all states agreed on a ban on the use of force with the explicit exception of self-defense, thus legally accepting only peaceful changes to the status quo. Situations may occur in which the use of force might be believed to be legitimate by moral standards although illegal. Thus, bound between the dichotomy of security and justice, the requirements of legality and legitimacy might not always coincide in international law.

The use of force has been a long standing phenomenon in international relations and has been considered to be directly linked to the sovereignty of states—the limitless power wielded by states to use all possible means to guard and protect their interests. However, the longer period that war has been associated with sovereignty of state, the more the issue has turned into a legal institution by itself. This paper looks at the prohibited and permissible use of force in International Relations. Developed social awareness has expanded the limits and the right to resort to war. This indeed has abolished the use of force or any form of threats in relation among nations, this has become a rule of law in international criminal law—its violation comes with criminal responsibility in the eyes of the international community. However, there are certain situations in which it is allowed to use force such as for self-defense purposes, humanitarian intervention, and preemptive power inter alia.

The term “law of war” refers to both the rules governing the resort to force and the rules governing the actual conduct of force in International Law (Peter, 1997). Because each of these two types of rules governs different subject matters, it is reasonable to deal with them separately. Therefore, this chapter is devoted to dealing with the rules governing the resort to force; while the next chapter entitled “International Humanitarian Law” is devoted to dealing with the rules governing the actual conduct of force. The rules governing the resort to force form a central element within International Law. These rules together with other principles such as territorial sovereignty, independence and equality of States provide the framework for the international order (Malcolm, 2008). While a domestic system prescribes the monopoly on the use of force by a State, through its governmental institutions, in order to enable the State to preserve its authority and maintain its control within its territory, the International Law seeks to minimize and regulate the use of force by States in their international relations in order to preserve and maintain peace and security in the world community. The position of International Law towards the use of force by States has not been the same throughout the history. Because of this fact, in the following sections we will deal with the use of force, first, before 1945, the establishment of the United Nations, and second, under the Charter of the United Nation

II. THE RULES RELATED TO THE USE OF FORCE BEFORE 1945

“War” is the apparent manifestation of the use of force by States. It is a status or condition of armed hostility between States. It comes into existence either by a formal declaration or by acts of armed force between States without a formal declaration. Early in History, war was resorted to for various reasons and causes without any distinction, and was conducted without any limitation and control. The distinction between “just war” and “unjust war” arose as a consequence of the Christianization of the Roman Empire and the abandonment by Christians of pacifism. The doctrine of “just war” was founded on the belief that force could be used if it complied with the

Index Terms- International relations, Use of force, Self-defense, Prohibition, United Nation, and Security Council.
divine will. Just war was to be employed as the ultimate sanction for the maintenance of an orderly society. St Augustine defined the just war in terms of avenging of injuries suffered where the guilty party had refused to make reparation. War was to be employed to punish wrongs and restore the peaceful status quo, nothing further. Aggression was unjust. The resort to force should be strictly controlled. St Thomas Aquinas in the Thirteenth Century went a further step in the definition of just war by declaring that war could be justified provided it was waged by sovereign authority, it was accompanied by just cause, and i.e. the punishment of wrongdoers, and it was supported by the right intentions on the part of the belligerents ( Bailey,1972) . The teachings of the Christian theologians on distinguishing between just war and unjust war were eventually adopted by the early classical writers on "the law of nations", such as Allmerca Gentile and his successor Hugo Grotius ( Bledsoe,2005). However, all of these writers took a different approach on this question in the light of the rise of the European nation-states and eventually modified the doctrine of just war. The doctrine became linked with the sovereignty of States, and it was approached in the light of wars between Christian States, each side being convinced of the justice of its cause. The early writers on the law of nations approached the doctrine of just war from a purely subjective point of view, admitting the possibility of both sides having a just cause and believing in being in the right even though one of them might have been objectively wrong. Thus, the doctrine of just war could not be objectively applied to determine whether or not a war was just, and consequently the distinction between just war and unjust war never became part of the law of nations. Eventually, in the Eighteenth Century, the distinction was virtually abandoned by the law of nations. The doctrine of the just war that arose with the increasing power of Christianity declined with the outbreak of the inter-Christian religious wars and the establishment of an order of secular national sovereign States in Europe. In the Nineteenth Century, war in the practice of the European States was often represented as a last resort, as a means of dispute settlement. The resort to war was regarded as an attribute of statehood. War was a legal state of affairs in International Law. It was to be justified if it was fought for the defense of certain vital interests. Each State remained the sole judge of its vital interests. Vital interests constituted a source for political justifications and excuses used for propaganda purposes, not a legal criterion of the legality of war. There also existed other methods of employing force that fell short of war, such as reprisals and blockades (Brownlie, 2012). The international jurists of the Nineteenth Century abandoned emphases on the legality of war (jus ad bellum), and concentrated on the legality of the conduct of war (Bledsoe, 2005). Therefore during this century, a series of regulatory conditions and limitations on the conduct of war, or of force in general, were recognized under International Law in order to minimize the resort to war, or at least to restrict its application. There also existed legal consequences resulting from the exercise of the right to resort to war. The unprecedented suffering of the First World War caused a revolutionary change in the attitudes towards (Malanczuk, 1997). The doctrine of just war was revived after this war. The creation of the League of Nations in 1919 constituted an effort by the world community to rebuild international affairs upon the basis of a general international institution which would oversee the conduct of the States to ensure that aggression could not happen again. The Covenant of the League of Nations, although it did not prohibit the resort to war altogether, it introduced a different attitude, than that existed previously, to the question of war in International Law. The Covenant set up procedures designated to restrict the resort to war to tolerable levels. It declared that members of the League agreed that they would submit their disputes, which likely to lead to a rupture, either to arbitration or judicial settlement, or to inquiry by the Council of the League. The members also agreed that in no case they would resort to war until the lapse of three months after the award by the arbitrators or the judicial decisions, or the report by the Council. During the years following the creation of the League of Nations, various efforts were made to fill the gap in the League system, which is to transform the partial prohibition of war into total prohibition of war. These efforts resulted in the conclusion of the General Treaty for the Renunciation of War in 1928 (known as the Kellogg-Briand Pact or Pact of Paris). The parties to this multilateral treaty condemned recourse to war for the solution of international controversies, agreed to renounce war as an instrument of national policy in their relation with one another, and agreed to settle all disputes or conflicts only by pacific means. This trend was adopted by the Charter of the United Nations in 1945.

III. THE USE OF FORCE UNDER THE CHARTER OF THE UNITED NATIONS

The Charter of the United Nations establishes a fundamental distinction between legal and illegal resort to force. By this, it has, in a way, revived in International Law the old distinction between just and unjust war. Moreover, it goes further than the position of the classical international law towards the use of force. While the classical international law did not place any restriction on the right of States to use force and to go to war, the Charter of the United Nations provides provisions aiming to control the use of force, on one hand prohibiting the use of force, and on the other hand permitting the use of force in exceptional cases.

3.1. The Prohibition of the Use of Force:

The preamble of the Charter of the United Nations starts with the determination of the peoples of the United Nations to save succeeding generations from the scourge of war, and their willingness to practice tolerance and live together in peace with one another as good neighbors, and not to use armed force except in the common interest. To this end Article 2(4) of the Charter provides:All members shall refrain in their international relations from the threat or use of force against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations. This article formulates the principle of the prohibition of the use of force in International Law, by imposing upon the States members of the United Nations the basic obligation to refrain from the threat or use of force in their international relations. The provision of this article, which marks the general acceptance of the prohibition of the use of force in international relations, is of universal validity. The principle of prohibition of the use of force bounds the States members of the United Nations and the United Nations itself, as

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well as, the few States which are not members of this international organization since it is a principle of customary international law. Article 2(4) mentions the use of force not the resort to war; by this, it intends to include in the prohibition all sorts of hostilities, short of war, in which States may be engaged. It prohibits not only the use of force but also the threat of force. The prohibition of the threat or use of force in international relations against the territorial integrity or political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations, as stated in Article 2(4), is reinforced by other provisions of the Charter, particularly paragraph 3 of the same article. Article 2(3) imposes upon States the obligation to “settle their international disputes by peaceful means in such a manner that international peace and security, and justice, are not endangered.” Furthermore, this prohibition is elaborated as a principle of International Law in the 1970 General Assembly “Declaration on Principles of International Law Concerning Friendly relations and Co-Operation among States in According with the Charter of the United Nations (U.N. Doc. 1970). The 1970 Declaration on Principles of International Law provides that the threat or use of force constitutes a violation of International Law and the Charter of the United Nations and should not be employed as a means of settling international issues. It declares that a war of aggression constitutes a crime against peace, for which there is responsibility under International Law. It lists systematically the obligations of States in this regard. Every State has to refrain from propaganda for wars of aggression. It has to refrain from the threat or use of force to violate the existing international boundaries of another State, or the international lines of demarcation. It has to refrain from acts of reprisal involving the use of force. It has to refrain from any forcible action which deprives peoples of their right to self-determination, freedom and independence. It has to refrain from organizing, instigating, assisting or participating in acts of civil strife or terrorist acts in another state, or acquiescing in organized activities within its territory directed towards the commission of such acts. The Declaration provides that the territory of a State shall not be the object of military occupation or acquisition by another State resulting from the threat or use of force, and that such territorial acquisition shall not be recognized as legal. The Declaration obliges all States to comply in good faith with their obligations under the generally recognized principles and rules of International Law with respect to the maintenance of international peace and security, and to make the United Nations security system based upon the Charter more effective. The Declaration, however, provides that its provisions shall not construed as enlarging or diminishing in any way the scope of the provisions of the Charter concerning cases in which the use of force is lawful. By this provision, the Declaration reaffirms the exceptions to the principle of the prohibition provided for in the Charter of the United Nations.

IV. THE EXCEPTIONS TO THE PROHIBITION OF THE USE OF FORCE

The Charter of the United Nations formulates two exceptions to the principle of the prohibition of the use of force in international relations. The first exception is the use of force in a case of exercising the right of individual or collective self-defense under Article 51. The second exception is the use of force by authorization of the Security Council of the United Nations under Chapter VII. The 1950 General Assembly “Uniting for Peace” Resolution formulates a third exception to the principle of the prohibition of the use of force, which is the use of force upon a recommendation of the General Assembly. A fourth exception is formulated by the 1974 General Assembly Resolution on “the Definition of Aggression” which entitles the people forcibly deprived of the right to self-determination, or under colonial domination or alien subjugation, to struggle to achieve their objectives in self-determination and independence (U.N. Doc. 1950). 

V. THE RIGHT OF SELF-DEFENSE

International law recognizes a right of self-defense, as the International Court of Justice (ICJ) affirmed in the Nicaragua Case on the use of force. Some commentators believe that the effect of Article 51 is only to preserve this right when an armed attack occurs, and that other acts of self-defense are banned by article 2(4). The more widely held opinion is that article 51 acknowledges this general right, and proceeds to lay down procedures for the specific situation when an armed attack does occur. Under the latter interpretation, the legitimate use of self-defense in situations when an armed attack has not actually occurred is still permitted. It is also to be noted that not every act of violence will constitute an armed attack. The ICJ has tried to clarify, in the Nicaragua case, what level of force is necessary to qualify as an armed attack. As a fundamental "Principle of the Organization" and a general principle of international law, Article 2(4) of the U.N. Charter requires that states refrain from the use of force, and states that all Members shall refrain in their international relations from the threat or use of force against the territorial integrity and political independence of any state, or in any other manner inconsistent with the Purposes of the United Nations (U.N. charter art 2). However, one must consider the prohibition of the use of force under the U.N. Charter in light of other relevant provisions. In Article 42, the U.N. Charter states that the "Security Council may take military enforcement measures in conformity with Chapter VII (U.N. charter art 42). Article 51 envisages a further lawful use of force in the event of an armed attack: Nothing in the present Charter shall impair the inherent right of individual or collective self-defense if an armed attack occurs against a Member of the United Nations, until the Security Council has taken the measures necessary to maintain international peace and security. Measures taken by Members in the exercise of this right of self-defense shall be immediately reported to the Security Council and shall not in any way affect the authority and responsibility of the Security Council under the present Charter to take at any time such action as it deems necessary in order to maintain or restore international peace and security (U.N. charter art. 51). The question in relation to anticipatory self-defense is, therefore, whether Article 51 of the U.N. Charter has become the only source of a state's right of self-defense in international law (and, therefore, one is limited to considering whether Article 51 permits anticipatory self-defense), or whether Article 51 only imposes certain conditions for the application of a pre-existing, inherent right of self-defense

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VIII. CONCLUSION

The exclusive right of using force is situated only in the UN Security Council. Nothing impairs the inherent right of individual and collective self-defense in case of committed armed attack against any member state of the UN until the Security Council takes the necessary measures for restoring international peace and security. The use of force by regional organizations like NATO, OSCE, etc. must be mandated by the UN Security Council. If we agree that the NATO Treaty does have a hard legal core which evens the most dynamic and innovative re-interpretation cannot erode, it is NATO’s subordination to the principles of the UN Charter. The right of self-defense, inherent in every state, includes logically the right of anticipatory self-defense, ensuring that a defender has sufficient flexibility to take defensive hostile measures without waiting for the attack. A state that would renounce the right of anticipatory self-defense could be indefensible in a world without a central world body that could prevent powerful aggressor states from acting at will. The elasticity of the doctrine of anticipatory self-defense should however not be stretched past logic and into fantasy. In the absence of a clear immediate threat, explaining one state’s aggression or violation of another state’s territorial sovereignty can lead to some unsubstantial claims.

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Historical-Sociology of Interaction in the city of Dawa
Dawa: The case of Oromo-Somali ethnic groups

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Abstract- Dire Dawa is a disputed city over claims of ownership between Oromia and Somalia regional states. Hence, among the Oromo and Somali ethnic groups. However, there was no conflict so far experienced between these ethnic groups in the city of Dire Dawa. The article attempted to study the basic reasons for such peaceful state of affairs in the city. To accomplish this objective, the researcher utilized qualitative research method. Sources of data- primary and secondary sources were used. Primary data as the main source was collected from informants and documents through interviews, observation, focus group discussion, and document analysis. The collected data was analyzed to find common indicators. The study finding revealed that these ethnic groups have developed a sense of belonging to the city of Dire Dawa. They developed a single vocabulary-ye-Dire-lij-. This single vocabulary was the result of cultural dialogue and understanding they developed over century through their interactions. Their interaction was their common cultural heritage which they mobilized to solve their competition over city ownership that avoided outright conflict. This was shown when the two ethnic groups agreed to share the terms of the city Council. This is a lesson that needs to be promoted and shared by others to avoid violent ethnic conflict over claim. It concluded that cultural diversity and intercultural dialogue is one of the surest guarantees of development and peace. The lesson from Dire Dawa provide values needed for economic development: values that are tolerant, trusting, and participatory.

Index Terms- Dire Dawa, Ethnic group, Oromo, Somali, Socio-cultural Interaction

I. INTRODUCTION

As history lessons taught us cities were centers where human cultures have reached maturity which laid the foundation for the present urban culture. This is because “…the City is the place where the greatest intensity of human experience, the biggest stores of change, and the significant events of history have been anchored.”

The above quoted statement reveals the important place cities have had and continue to have among human societies. Cities were attracting peoples for better life, employment, education, and in general for prosperity, and still are centers of hope for prospect particularly in poor continent and nations like Ethiopia. Therefore, cities use to attract people of different back ground from different corners of a country.

An urban settlement is formed by a permanently settled group of people who are not mainly concerned with primary food production. As the city is also a permanent settlement there is a relationship between the people and the surrounding people and settlement. The study of the interaction of people in cities means the study of culture for “cities are the sites of culture industries…” This article presents one of such cities, Dire Dawa which is located in eastern Ethiopia with particular emphasis on ethnic group interaction. Dire Dawa is one of the two chartered cities (the other being Addis Ababa) in Ethiopia under the 1995 F.D.R.E constitution. This article is limited only to the city proper Dire Dawa with specific emphasis on the Oromo-Somali ethnic group interactions in the city. Therefore, the Oromo and Somali ethnic group interaction is discussed in the whole context of Dire Dawa because city life is often characterized by interdependence, so separating the part from its whole might not give the full picture of the part under discussion.

II. DIRE DAWA: BRIEF HISTORICAL OVERVIEW

Everything that exists in the present has come out of the past, and no matter how new and unique it seems to be, it carries some of the past with it. The urban phenomenon is the most characteristic feature of 20th centuries. Although urbanization is not new in the history of Ethiopia, the first half of the 20th century witnessed the rapid growth of towns. Urbanization in Ethiopia was conditioned by historical factors, that is, the combination of political and military factors. In the 19th century, a number of middle sized towns have flourished following the occupation by the armies of Kings. In other word, most of cities/towns have developed from a military garrison. Hence most of Ethiopian towns followed such trend and owed the political, military and administrative activities of the state. But the case of Dire Dawa denotes a little bit different trend.

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The establishment of Dire Dawa followed the railway Concession of 1894 that led to the formation of the rail way company called “the compagnie Imperiale des Chemin de fer ethiopiens” to link Addis Ababa with Djibouti via Harar in 1896. Then the rail way construction which has begun in 1897 reached its first terminal in 1902 and this site was named “New Harar” later renamed Dire Dawa.6

Dire Dawa was the result of environmental and topographic conditions which the French engineers found it suitable for the rail way route than the difficult topography for the rail route through Harar which in turn dictated change in place of terminal.7 In other words, historical incidence with other factors played greater role in the establishment of the city thereby marking unusual trend of urban development in Ethiopia. Dire Dawa initially unintended result of the rail way, once a semi-desert plain full of wild animals has changed in to the second largest urban center of Ethiopia in subsequent years.

As records show trade routes covering considerable distances has brought diverse cultures face to face in orderly exchange. Similarly, Dire Dawa which has grown from a railway depot to the most important town with a number of industries, as well as the rail way, offering employment opportunities, has attracted large number of people including Ethiopians and foreigners who dwelt in separate residence-Europeans reside in a quarter named Kezirah/Gezira an Arabic word for town, and a quarter named as Magala a Somali word for a village was residence for the Ethiopians, Indians, and Arabs.8 There were ethnic groups: Afar, Amhara, Guriga, Harrari, Oromo and Somali. Thus, Dire Dawa has become the home of different groups of people coming from all corners of Ethiopia and outside of Ethiopia which gave the current image of population composition. The present population composition is, therefore, the result of historical process continued over longer periods of time all the way to the present marking the interaction of people at different level.

As a historical continuity Dire Dawa has different quarters with different name accommodating all ethnic groups unlike the early quarters built to separate ethnic groups. As a result of the living together of different ethnic groups, there follow an exchange of ideas, language, religion and way of life that form what generally termed as cultural exchange.

It is interesting to note that most of the names of the various quarters of the town reflect the ethnic background of people who might have lived in it. Kezira and Greek camp are foreign names where once foreigners had lived in. However, although one might observe the dominance of this or that group in one quarter, none of these quarters are ethnically homogenous. That is while the number of the Somali population living in Hafata-Issa out numbers the population size of the Oromos. The population size of the Somali and the Amharas is outnumbered by the Oromos in Laga-Hare. In Sabean Amharic mother tongue speakers, Oromo Speakers, and Somali speakers are living together. Today most of the quarters of the town are becoming integrated, that is to say, Christians and Muslims tolerate living together. In all quarters churches and Masjids are found together, the Church of St. George in Muslim dominated Laga-Hare is of such instance. The variety of ethnic groups brought about a language phenomenon which is very special to Dire Dawa. Most of the inhabitants are at least bilingual. Amharic, the federal government working language, is certainly the most widely diffused language, but Somali and Afaan Oromo taken together represent the mother tongue of the larger majority of the inhabitants.

The above mentioned quarters of Dire Dawa may show the concept of Neighborhood which is fundamentally bound by a sense of place. Neighborhoods are communities of place. A place means “having a number of close family members living within walking distance of one another and engaging in the same rituals and practices according to the same calendar.”9 In light of this, different neighborhoods in Dire Dawa need not be viewed as ethnic boundaries because they are named after the name of individuals, natural features or similar attributes. Although ethnic groups may be based up on residence in the locality, they essentially center on shared attitudes and behaviors that bind together the people themselves. The ethnic groups, therefore, provides Social services- from informal to formal, and networks such as sending their children to the same schools, sharing same social institutions like Ikub and Idir etc. It is in such way that the people of Dire Dawa and the interaction of ethnic groups is discussed in this article.

III. THE PEOPLE OF DIRE DAWA

The population of Dire Dawa estimated about 341,834 of which 233,224 or 67.93% which is indicated to be urban in 2007.10 The urban community consists of myriad ethnic groups each characterized by its own distinct and identifiable language, religion and cultural practices within the same geopolitical space. While sharing the same geopolitical space in a densely populated urban setting might be expected to necessitate ethnic interdependency, one might also infer the subsequent change from ethnic based traditional life to modern production and consumption based economy.

7 Henry Baldet:p.16,17.
8 Shiferaw Bekele:pp.612-617.
Among the urban population of Dire Dawa, Oromo with 77,103 (both sexes) population, Amhara with 68,728 (both sexes) population, and Somali with 54,807 constitute the three groups with larger population size. \(^1\) These ethnic groups are living in integrated contact with each other and with other ethnic groups in each quarter with a relative numerical difference of Amhara, Oromo, or Somali ethnic groups.

The Oromo and Somali ethnic groups are in constant interactions of various forms for long period of time which holds true for other ethnic groups as well. Oromo and Somali have certain common features. That is both speak languages that belong to the Cushitic language phylum; members of both groups are predominantly Islam. As the Somalis are often referred as agents of Islamization in the eastern section of the country \(^2\), the current religion of the Oromos of eastern Ethiopia might be an indication to constant intergroup social contact. Indicating this intergroup religious relationship Braukamper noted “…the Somali version of Islam has provided the only available model of Islamic culture for the south eastern Oromo.” \(^3\) Thus, inter ethnic social relationship between the Somali and the Oromo can be inferred to have been going on for centuries, which gave ground for the later multifaceted interaction.

Because “city life [is] understood as a process of adaptation to the environment”, \(^4\) there are daily intergroup interactions at different settings such as in economic, political and social areas. Interaction cannot always show harmony and peace, there are also conflctual interactions. Thus, the cultural practice of each ethnic group built in historical process of both peaceful and conflctual interaction.

Although disputed by the Somalis, the Oromos claim the name of the town-Dire Dawa to have its origin in their language. In their language, depending on the pronunciation of the initial sound of the word, it means either “a plain of medicine” or “a plain of fight”. The tow meanings result from the utterance of the initial sound in the word “Dawa” either as voiced, alveolar stop or as its implosive counterpart. That is when the initial sound is uttered with voiced, alveolar stop, it has the meaning “Medicine”; on the other hand, when the initial sound is uttered with voiced, alveolar stop, it has the meaning “fight”. \(^5\) So in both case the meaning of the town reveals Oromo route word with the plain of Medicine being accepted as the meaning of Dire Dawa. \(^6\)

On the other hand the Somalis claim that the first to settle in Dire Dawa were the Gurgura Somali who named the city “Dire Dabwa” or Dire Dawa which means in Somali language “the place where Dir conquered or hit with his spear”. \(^7\) Currently the Gurguras are the Somali clan who speak Afaan Oromo and Somali language. In any case the dispute over the meaning of the word “Dire Dawa” has continued and will continue to be point of debate but the Oromos and Somalis are living together in the city.

Given the current political arrangements the Oromos and Somalis actively participate in regional and state offices and administration. Most of the Somalis are traders engaged in trade with the help of their rural relatives. They also send their children to in schools. They also make their living by engaging in service sectors. The Somalis also run the political affair of the city along with the Oromos to rule Dire Dawa as a mayor. \(^8\)

In terms of religion the Oromos and Somali in Dire Dawa are followers of the religion Islam. In all kebeles there are two or more Masjids. The Muslims in Dire Dawa are peaceful and respect the religion of others. \(^9\) In addition, they are related with other ethnic groups with individual members involved in marketing, administration, teaching and service sector in a form of urban networks. \(^10\)

When one see the report and claim of members of these ethnic groups at glance regarding their cultural practices in Dire Dawa, it seems quite different and unrelated. But when one examines closely and participate in their actual day to day activities, these two ethnic groups share many practices which appears to be difficult to demarcate which practice goes to which ethnic group. There is continuous interaction between different ethnic groups in Dire Dawa at different settings that gives special feature for Dire Dawa. The Oromo and Somali send their children to same school, rice form the dishes of both groups and as urban societies interconnected in networks of many forms and activities. \(^11\)

### IV. The Oromo-Somali Ethnic Group Interactions

According to Philip Kottak, an Ethnic Group is almost synonymous with a culture. We use the term “Ethnic Group” when we are describing a particular culture in a nation or region that contain others.\(^12\) In addition an ethnic group is “a category whose members are thought to share a common origin and to seem satisfied with the status quo and accepted the ‘medicine’ version.


\(^12\) Ulrich Braukamper,” The Sanctuary of Shaykh Husayn and the Oromo-Somali Connections in Bale(Ethiopia)” in Frankfurter Afrikanistische Blatter(Frankfurt/Main;Nummer 1,1989),p.120.

\(^13\) Braukamper,ibid

\(^14\) John G. Bruhn,p.34.

\(^15\) Henry Baidet,p.15.

\(^16\) Informants:Ato Mohamad Amin, interviewed on July 21,2011; Ato Jemal Yuya,Interviewed on July 22,2011; Information on the meaning of Dire Dawa has survived orally among the Oromos with various version such as ‘the plain of female’ as the writer of this paper realized through interview. However, the Oromos seems satisfied with the status quo and accepted the ‘medicine’ version.

\(^17\) Informants: Somali elders

\(^18\) Informants:Ato Mohamad Amin, note 19.

\(^19\) Informants:Ato Mohamad Amin, Ato Jemal Yuya, interviewed on 22/7/2011 in Hafat-Issa Dire Dawa

\(^20\) Informants: note 23.; The writer also realized that as being participant-observer.

\(^21\) This is realized by the writer’s observation and comparison made between the claimed cultural similarities with their counter parts outside of this cities.


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share important element of common culture like a common language, religion."23 The word ‘Ethnic’ or “Ethnicity” is one of controversial term most entertained by Social Scientists. However, Ethnicity in this article is treated in terms of cultural concept. Hence, Ethnicity is “about how individuals and groups of different cultural backgrounds interact, or do not interact, with each other, and how...ethnic group fit into larger society."24 Ethnic group interaction is about the contact of a culturally distinguishable group with other groups within a particular society.25 Interaction involves the sharing, change and exchange of cultures in face to face situations in everyday life. The Oromo-Somali ethnic group interaction involves such face to face contact in everyday life. Since ethnicity is based on cultural similarities and differences in a region, there are factors that bring different cultural groups into contact thereby promoting either a peaceful coexistence and/or violent conflict interactions such as: diffusion, and acculturation. Diffusion represent a situation where aspects of one culture enter and incorporated in to another culture due to constant contact between neighboring groups through trade, intermarriage, or war. The other mechanism is acculturation when cultural features are exchanged through first hand contact between groups. In general in situations of continuous contact, cultures also have exchanged and combined foods, recipes, music, clothing, and other features;26 The Oromo-Somali interaction has passed through long and interrelated contact with each other and with other ethnic groups living in Dire Dawa. Accordingly, both Oromo and Somali took some aspect and incorporated it in to their culture through diffusion and acculturation. There are many stances of such aspect. Clothing is one; the Somali Women dressing called “Dirya” and“Gogora” is identified as the wearing of the Oromo women and even the dressing of Dire Dawa and Eastern Ethiopia. In addition to closer residence between the Oromos and Somalis, they share common place of religion. They intermarry; both attend religious rituals and festivals together. 

Ethnic diversity may be characterized by positive intergroup interaction and peaceful coexistence or by conflict. In Dire Dawa different ethnic groups live together with reasonable harmony and peace, and love, hence the popular saying “Dire is love”. The Oromo-Somali ethnic group interaction is associated with peaceful coexistence and harmony. Different reasons might account for this: the existence of plural Society and multiculturality can be among the reasons.

Dire Dawa can be considered as having Plural Society. Plural Society is defined as "a Society combining ethnic contrasts, use of different environmental resources by each group, and the economic interdependence of those groups."27 More over the environment of any one ethnic group is defined by

the presence and activities of other ethnic groups on which it depends. This in other word means, different ethnic groups make their living in different ways and depend on each other’s activities and exchange with one another.28 Accordingly, the Oromo_Somali ethnic groups in Dire Dawa are highly integrated for a matter of living and, one can realizes this simply by making a tour to different market centers found in different quarters of the city.

However, despite all these integrations, the Oromos and the Somalis have managed to maintain interethnic distinction through the use of ethnically defined public places such as schools which typifies the characteristics feature of a Plural Society—that is maintaining ethnic distinction even after a generation contact.29 This is to mean that although members of both communities are predominantly Muslim, their kids go to separate Islamic schools. That is while the Oromo kids go to a school locally called as Mehadal Nur, the Somali kids go to this school locally called-Haji Ali. These schools are financed by an Islamic bank from the Middle East with the objective of facilitating Islam solidarity.30 While the school to which Somali kids go to teaches up to grade ten; the school to which Oromo kids go to teaches up to college preparatory classes. The curriculum of both schools includes similar religious and secular education. The major difference, in between schools curricular difference lays in the use of ethnic languages as a medium of instruction at primary school level. Up on completion of grade ten, the Somali kids go to the Islamic Oromo School for college preparatory classes. Thus, while similarities in religious backgrounds integrate members of both groups, the attendant fact of linguistic difference vie to set them apart, hence the paradox of integration and segregation at once.

In addition, Multiculturalism can also be a reason for peaceful coexistence of the Oromo and Somali ethnic groups in Dire Dawa. By considering the existence of many ethnic groups one can say that Dire Dawa is a land of multicultural society, because in a Multicultural Society” Cultural and religious differences are recognized as legitimate and respected by different groups."31 Dire Dawa also represents places where multiculturalism is seen and practiced because “multiculturalism works best in a Society...[that ] promotes free expressions and in which there are many and diverse ethic groups."32 Dire Dawa is known by the out-siders as having open society free to express their ideas openly and freely with-out restriction, and the use of taboo words to insult others is attached to it. Thus, “የደውም እንከታት (a person of Dire Dawa and/or a Kid of Dire Dawa has no problems or complexities) summarizes society of Dire Dawa on the free expression of ideas and emotions, and opinions which includes the Oromo and Somali ethnic groups. That is why the writer also pointed out multiculturalism as a reason for peaceful coexistence along with other reasons because.

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26 John G. Bhrun.75,76.,; David B. Brienkerhoff, et al.p.46,47.
27 Conard P. Kottak.93.; William G.Flangan.381
The interaction of different ethnic groups can also be expressed in violent inter-ethnic confrontation. Violent ethnic conflict can be caused by: political, economic, religious, linguistic, cultural, or “racial” factors. The causes include a sense of injustice because of resource distribution, economic or political competition, and reaction to prejudice or discrimination. Although discussing the causes of ethnic conflict is not the purpose and at the same is beyond the capacity of this article, presenting instances of conflicts among the group under discussion would give the full picture of their interaction. Since ethnic groups are in constant interaction conflict is natural but there is difference in intensity, so in this section the conflict between the groups under discussion will be discussed.

The intensity of conflict between Oromo and Somali in the city is not significant. However, there have been areas of contentions revolving around political control. The main center of conflict was claim over the city of Dire Dawa with both groups claiming ownership. There are oral reports of violent conflict in the 1980s and early years of 1990s involving armed struggle using automatic weapons infiltrated in to the city illegally.

It seems that it is by taking this competition into consideration, the 1991 charter, and the 1995 constitution gave special status to Dire Dawa as chartered city ruled by mayor being chosen by the Federal government from Addis Ababa up until August 2006. From that on Dire Dawa has formed its own council with mayors to be chosen from only the Oromo and the Somali in turn. In such arrangement the Dire Dawa political power has been divided between the two ethnic groups thereby addressed the violent competition over claims and brought an end to conflict. The political arrangement has, therefore, provided peaceful but competitive ground for these ethnic groups to interact on issues beyond their ethnic groups to the city of Dire Dawa as one community.

Interaction is a “continuous process, generating knowledge (of the social status of ethnicity, for instance) which, albeit potentially experienced as stable, constraining, or ‘imperative’ at the individual level (or not, according to the conventions in play)...” In this sense, the current interaction between the Oromo and Somali ethnic groups along with other ethnic group is stable which appears to have developed over longer periods of interaction and historical process. Thus, the political power distribution can be viewed from intergroup historical and sociopolitical relationships.

The cultural interaction is the common heritage of the city. In short it is the identity of the people of Dire Dawa. Such experiences are base for the growth and development of a society which presuppose as expressed by UNESCO “…respect for cultural diversity and intercultural dialogue is one of the surest guarantees of development and peace.” The case of Dire Dawa is a useful lesson that would benefit the people and would be a major asset for development effort of Dire Dawa.

V. CONCLUSION

Although ethnic group interaction at city is complex and difficult, the article tried to present the Oromo_Somali ethnic group interaction in historical process starting with the history of Dire Dawa in city life context with factors that mostly bring people in day to day face to face contact such as: economic, Political and Socio-Cultural activities.

Indeed, when one examines the languages spoken, the religious practices followed, or different communities represented, one realizes that there are many different values which make up the people of Dire Dawa, yet these people of widely different backgrounds and beliefs lives harmoniously together. Thus, it is the common heritage of humanity.

Dire Dawa for sure removed or improved many barriers which separate peoples. Christians and Muslims, Amharas, Gurage, Oromo, Somali and etc… educated in the same schools, working in the same factories and Offices and enjoying the same recreational centers, come to realize that they are not so different after all. Thus, they understand that they belong to the same community, and are building it together. Dire Dawa bringing together many different peoples can be called a human melting-pot where integration is accomplished. The Oromo and Somali ethnic groups are also part of such mentality.

These are things about which we are usually proud; but sometimes they may be important and worthy of conservation because they are reminders of how societies can go wrong; they provide salutary lessons for present and future generations.

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[33 Ibid., .96,97
[34 Informants:Ato Mohamad Amin, Ato Abdulwali, Ato Yunus, Ato Jemal
[36 Sara Vaughan,.P. 71.


Planning and Forecasting in Capital Budgeting: The Practice of Business Organizations in Ethiopia

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Abstract- Capital investment decisions play vital role for the achievement of strategic plan of organizations. The main objective of this study is to investigate the capital budgeting practice of business organizations in Ethiopia with especial reference to strategic planning, project idea generation and cash forecasting. To achieve this objective, primary data was collected using self administered questionnaire from 109 large private and public owned business organizations found in Addis Ababa, Ethiopia. The finding of the study showed that the majority of the firms try to link capital investment projects to their strategic plan. Top managers and board of directors are the main sources of project idea and most organizations do not make cash forecasting properly. For instance, they will not incorporate working capital, inflation and tax effect of depreciation in to account while forecasting cash flows.

Index Terms- Cash Forecasting, Capital Investment, Project Identification, Strategic Planning

I. INTRODUCTION

The planning phase of a firm’s capital budgeting process is concerned with the articulation of broad investment strategy and the generation and preliminary screening of project proposals. The investment strategy of the firm delineates the broad areas or types of investment that a firm plans to undertake. This provides the framework which shapes, guides and circumscribes the identification of project opportunity. Once a project proposal is identified, it needs to be examined. To begin with, a preliminary analysis is done to justify a feasibility study and what aspects of the project are critical to its viability and hence warrant an in-depth investigation. This is followed by detail feasibility study which is meant to assess whether the project is promising and worthwhile. In short, Klastorin (2004, P.13) described the planning phase as the most critical phase defined by the “six Ps” rule of project management that are read as “ Prior Planning Precludes Poor Project Performance”.

The author has undertaken a survey that assesses the practice of capital budgeting starting from initial strategic planning to post implementation audit. The goal is to perform an in-depth analysis on the current practices of capital budgeting in least developed country, Ethiopia. In particular, in this article the researcher is interested as to how companies in least developed country perform planning and forecasting for investment projects. This research will reveal the gap, if any, between theory and practice of developed and least developed countries with respect to capital budgeting practice. The study focuses on large business organization by Ethiopian standard, which are selected from industry and service sectors as well as from private and state owned firms. This will enable to analyze the practice across sectors and ownerships. The remaining part of this paper is structured as follows. Section two explains the research problem, section three reviews related literature. Section four presents the research design and methodology adopted in the study. Section five presents the result, analysis and discussion and finally section six concludes the paper.

II. RESEARCH PROBLEM AND OBJECTIVES

Capital budgeting is the process of planning, analyzing, selecting, implementing and controlling of capital investment (Dayananda, et al, 2002). Boersama (1978) argued that capital budgeting is a crucial decision for the firm's success for the following reasons. First, capital investment typically account for large amount of funds of the organization. Second, capital investments normally have a fundamental effect on the future cash flows of the organization once an investment decision has been taken. Third, it is often not possible to reverse it, or it is very costly to do so, once the funds have been committed and funds are normally tied up for a considerable period of time. Fourth, since capital budgeting decisions are long term and infrequent, it does not give chance to CFO’s to learn from experience and finally, capital investments affect the profitability and long-term strategy of the organizations. These reasons call for management to do their home work before committing their cash to capital investments.

Different researchers have given different number of phases in capital budgeting process. Despite the difference in the number of phases, the underlying concept is almost similar in all the classifications. Hence the main phases of capital budgeting in most of the studies include; planning, Forecasting cash flow, appraisal of investment projects, selecting the best investment projects, Implementation, Monitoring and control and last but not least, post implementation audits.

Although all the phases are very important to identify and undertake viable capital investment projects, the academia and practitioners most of the time give high emphasis only to appraisal and selection stage of capital budgeting process. These can be evidenced by the too much studies conducted and the increase in sophistication of appraisal techniques from time to time. Theoretically, although it is believed that planning and forecasting are crucial starting steps in capital budgeting, there are few empirical evidences that show the actual practice particularly in least developed country like Ethiopia. Especially, empirical evidence on strategic planning, investment idea generation, preliminary screening and cash forecasting are...
missing. Therefore, the main objective of this study is to investigate the capital budgeting practice with special reference to planning and forecasting stage using evidence from Ethiopian firms. Specifically, the study tries

1. to examine the link between strategic planning and capital investment decision
2. to assess the capital project identification and screening process followed by firms.
3. to identify problems of forecasting cash inflow and outflow related to capital projects

III. LITERATURE REVIEW

a) Strategic Planning

The planning process should start with higher level management setting the firm’s corporate goals. Management then develops a strategy by which the firm plans to achieve its goals in a risky environment. A firm’s business strategy gives the framework within which it seeks capital investment opportunity and from which major capital budgeting decisions logically come out. Companies should reject projects offering high returns but fall outside strategic thinking. That means, ultimately, the capital investment must tie up with corporate strategy so that each project contributes to an element of that strategy (Pike & Neale, 2006).

Strategic planning is the first stage in capital budgeting which convert the firm’s corporate goal into specific policies and directions. A strategic plan is the grand design of the firm and clearly indicates the business the firm is in and where it intends to go in the future. A firm’s vision and mission is encapsulated in its strategic planning framework and any Capital investment should originate from the strategic plan of the firm. The strategic planning stage takes the firm’s goal and converts it into specific objectives; business development areas are identified, priorities are set, specifies the structure, and guides the overall planning process in the quest of achieving objectives (Dayananda et al., 2002).

Chandra (2009) stated that there are different levels of strategic planning based on the different levels of management. Corporate strategy is concerned with where resources should be invested which further breeds the following two key corporate level resource allocation questions including; which business should the firm invest in? and what should be the allocation of the firm’s resources across various businesses in a portfolio? Business strategy by contrast is concerned with how the firm should compete in its chosen product market. A firm may choose to follow a strategy of cost leadership or product differentiation or both. Strategic formulation should be hierarchical in which business strategies should emanate from corporate strategy and individual projects should be in line with business unit strategy. Therefore, when seen from the whole organization point of view, projects that support the business or corporate strategy should be undertaken. Individually, a project may not be viable but it may be essential for implementing the chosen strategy. This is because, what matters more is the achievement of the investment strategy as a whole not the attractiveness of individual projects. Therefore, Capital projects should be viewed not simply in isolation, but within the context of the business, its goals and strategic direction (Pike & Neale, 2006).

While well managed firms align capital budgeting to strategy, in many firms the tie in between strategy and capital budgeting is somewhat loose in actual practice. According to Chandra (2009), the followings are some of the reasons. First, operating units view the investment proposals from their limited perspective and impact of the capital project on the overall corporate goal is none of their business. Second, capital budgeting proposals are often considered as self contained project and viewed as more or less in isolation. The logic for this is that, if each proposal is sound, a collection of such proposals together should be sound and finally since many project proposals prepared at the bottom having good viability may be rejected by top managers as a result of their negative impact on the overall strategy, those who make the feasibility at the bottom level will be frustrated.

In general, a company’s ability to succeed in highly competitive market depends to a great extent on its ability to regenerate itself through wealth-creating capital investment decisions compatible with business strategy. In order to ensure that strategy and long range plans tightly undergird with the capital budgeting process, the following ought to be done. Long range planning should precedes capital budgeting, long range plans should be communicated to all persons involved in the process of capital budgeting and finally, during the capital budgeting exercise, investment proposals should be viewed in the context of longer range plans not in isolation.

b) Identification and Initial Screening of Project Proposals

In the current globalization epoch where dramatic changes are day to day phenomenon, survival and success in the business world rests more than ever on making the right decisions at the right time. Capital budgeting is one of the most critical business decisions to be undertaken by business owners or managers since capital investments tie financial resources for a relatively long period of time. But how can the right capital investment are identified? Where do positive NPV projects come from? These are kinds of questions asked at the identification stage of capital budgeting process?

The identification of investment opportunities and generation of investment project proposals is an important step in the capital budgeting process. The search for promising investment idea is the first step towards creating a successful business. The key to success lies in getting in to the right investment idea at the right time. While this advice seems simple, its execution is difficult because good investment idea tend to be hard to pin down. Identification of such investment opportunity requires imagination, sensitivity to environmental change and assessment of the strength, weakness, opportunity and threat. The task is partly formal and partly informal, partly requiring objective analysis of quantitative factors, partly requiring subjective evaluation of qualitative factors, partly open to control, partly dependent on fortuitous circumstance. Especially, in highly competitive market, selecting wealth-creating capital projects is extremely difficult. It is easier to evaluate profitable projects than it is to find them (Scott et al., 1999; Pike & Neale, 2006; Chandra, 2009).

A profitable investment proposal is not just born; someone has to suggest it. Investment proposals can originate from levels ranging from the employee on the shop floor to top-level
management. A capital budgeting system in which proposals originate at the department and division level is referred to as a bottom-up system and one in which proposals originate with top management is referred to as a top-down system. In practice, projects generated from lower levels of the firm take longer to pass through and are subject to more qualitative and quantitative scrutiny. However, projects that are generated from top levels of management generally do not have to be justified financially and accepted immediately (Hatfield et al., 2007).

At department level, depending on the nature of the firm, investment proposals can originate from the different departments. For new products or service, proposals usually come from individual with technical experts or marketing experts. These people may feel that they can give a product or service which can cater to a presently unmet need or serve a market where demand exceeds supply or effectively compete with similar products or service because of certain favourable features like better quality or lower price. This idea if supported by finance can become a promising capital investment and these is how expansion of existing business will be undertaken (Chandra, 2009). In addition, a proposal to replace a piece of equipment usually originates from the specific departments or functions and sometimes, excellent investment suggestions may come through informal processes such as employee chats in the staff lounge.

On the other hand strategic decision such as idea for new business or idea for reaching a new territory can come from top level managers or board of directors. This people are endowed with overall strategic issue and can see the different opportunity because of their strategic position and the power they have. For the identification phase of such non-routine capital budgeting decisions, especially those of a more strategic nature, managers need to conduct environmental scanning, gathering information that is largely externally oriented. Managers should not expect the formal information system within the organisations, which is set up to help manage day to day operation be helpful in identifying such non routine investment ideas (Pike & Neale, 2006).

In addition, firms have research and development (R&D) divisions constantly searching for and researching into new goods, services and processes and identifying attractive investment opportunities. Research and development department of firms can also come up with modification of the existing goods and service. In addition, some investments are mandatory and should be undertaken (Dayananda et al., 2002). Therefore, firms should ensure that they have searched and identified potentially attractive investment opportunities and proposals, because the remainder of the Investment analysis process can only assure that the best of the proposed capital projects are appraised, selected and implemented.

Chandra (2009) advice that the following are helpful steps in generating investment idea. First the firm should Undertake SWOT analysis. Periodic SWOT analysis facilitates the generation of ideas. The second is clear preparation and prioritization of objectives which helps in channelling the effort of employees and encourages them think more strategically. The final strategy is creating conducive climate since creativity of people and their entrepreneurial urges requires favourable organizational climate. Generating investment ideas involves considerable effort, time and risk. Hence Chandra (2009) further suggests that good investment idea can be obtained by doing the following: analyzing the performance of existing industries, examining the inputs and outputs of various industries, reviewing imports and exports, studying plan and government guideline, looking at the suggestions of financial institutions, investigating local material and resources, analyzing economic and social trends and finally studying new technological developments. He also stated that porters model, lifecycle approach and experience curve are the most popular tools of identifying promising investment opportunity.

In addition, there should be a mechanism such that investment suggestions coming from inside the firm, such as from its employees, or from outside the firm, such as from advisors to the firm, are listened to by management. The process of getting investment idea from all levels of the organization must be a formal continuous effort and institutionalized by an incentive system that rewards individuals that generate good investment idea. Any manager who has experienced the frustration of having an investment proposal dismissed, or an accepted proposal fail, is likely to develop an inbuilt resistance to creating further proposals unless the organisation’s culture and rewards are conducive to such activity.

Specifically Pike & Neal (2006) advices that top management should seek to ensure that the most suitable projects are submitted by managers through establishing mechanisms that induce behaviour congruence. The accounting information system, reward system and capital budgeting procedures should all encourage managers to put forward the proposals that top management is looking for. However, in practice, the accounting information system and reward mechanism encourage divisional managers to promote their own interests at the expense of those of the organisation, and to emphasise short-term profit performance at the expense of the longer term. Capital budgeting then becomes a game, with the accounting and reward systems as its rules. Cash flow estimates are biased to maximise the gains to individuals within such rules.

In practice, investment opportunity originates from a variety of sources. According to the study by Hatfield et al. (2007) project proposals can arise from customers, suppliers, competitive forces, trade magazines and capital equipment shows. Many projects, such as replacement, capacity, quality and safety tend to originate from the lower-level managers. Larger, strategic type projects can originate from both upper-level and lower-level management. Pandey (1989) found out that more than 50% of the investment ideas in Indian companies were generated at the lower operational level. The contribution of higher management body is minimal. In line with this, Mukherjee and Henderson (1987) also argued that idea for new projects should come from lower level of an organization. They further concluded that finance executives are not project originators; rather they are receivers of packed investment plan for further evaluation. But the finding of Singh et al. (2012) is opposite in which most companies in India have the origination of new investment proposal at the top management level.

c) Forecasting Cash Flow Related to Capital Projects

Managers in business usually view profit as the best measure of performance. It might, therefore, be assumed that
capital project appraisal should seek to assess whether the investment is expected to be ‘profitable’. Indeed, many firms do use such an approach. However, most financial management books advocate that investment appraisal should be based on cash flow not accounting profit. Cash flow is not the same thing as profit for two reasons. First, profit as measured by an accountant is based on the accrual concept in which revenue is recognized when it is earned, rather than when cash is collected and expense is acknowledged when it is incurred rather than when cash is paid. In other words, profits include cash revenue as well as receivables and exclude cash expense as well as payables. Second, in computing profit, expenditures are arbitrarily divided into revenue and capital expenditures (Pandey, 2005).

A project successfully passing a preliminary screening stage usually requires further analysis. Such analysis involves identifying and estimating the projects’ incremental cash flow. Incremental cash flows are inflows and outflows of cash associated to a given project, which would disappear if the project is not accepted. It should be measured by comparing the cash flows of the firm ‘with’ the project and the cash flows of the firm ‘without’ the project. Such cash flow estimation is the most crucial step in investment analysis since sophisticated technique applied to incorrect cash flow would produce wrong result. Therefore, financial managers should make sure that the cash flow estimates are on the basis of the information supplied by experts (Danadayanda et al., 2002). Such incremental cash estimation should be preceded with market analysis and technical analysis. Because the output of these two are the base for accurate forecasting of cash flow.

Forecasting cash flow involves numerous variables and many participants. Depending on the type of investment proposals, various departments within an organization such as engineering, marketing, accounting and production are responsible to provide the required information for such cash flow estimation. Capital outlay are estimated by engineering and product development department based on the outputs of technical analysis, revenue projections are provided by marketing department and operating costs are estimated by production people, cost accountants, purchasing managers, personnel managers, tax experts based on market analysis. The role of financial managers is to coordinate the effort of various departments and obtain information from them, ensure that the forecast are based on a set of consistent economic assumptions, keep the forecast focused on relevant variables and minimize the biases in cash flow forecasting. Smaller companies which do not have expertise in all these areas may rely on outside consultant, at least for large or important capital investments (Chandera, 2009).

For analytical purpose, project cash flows may be separated into three categories (Dayananda et al., 2002). Initial investment is the net cash expenditure in the period for acquiring the capital project. It includes the cost of any land, building, machinery, equipment etc incurred to undertake the project. This cost also includes freight, setup and testing expense, and initial increase in working capital associated with the new capital asset. Thus initial investment will be equal to gross investment plus increase in networking capital. Further, for replacement investment decisions, the existing asset should be sold if the new asset is to be acquired. The sale of the existing asset generates additional cash inflow. The cash proceeds from the sale of the existing old assets should be deducted to arrive at the initial net investment. This may also include additional ‘middle-way’ investments such as upgrades and increases in working capital investments. Operating cash flow over the project involves the incremental after tax cash flow resulting from the increased revenue plus saving in labour cost, material cost or reduction in selling expense. Increase in interest paid as a result of issuing bonds to finance the project should not be incorporated as the cost of fund needed to finance the project are implicitly accounted for by discounting the project back to present value using the required rate of return. Terminal cash inflow is due to disposal of capital assets acquired at the beginning. Cash flow associated with the project termination generally includes the residual value of the project plus or minus any taxable gains or losses associated with its sales.

The project planning horizon of a decision maker may be defined as the period of time over which formulation of investment proposal is required. As net cash flows of an investment project are a function of the time period covered in the feasibility study, the planning horizon have a considerable impact on the result of the financial analysis. In addition, since the values obtained for the discounted cash flows and the various profitability and efficiency ratios vary sometimes considerably with the length of the planning period, the determination of the planning horizon of a feasibility study is often a very critical task. The relationship between the planning horizon and project life should therefore be considered when appraising an investment project. The planning period determined by the promoter must consider the economic lifetime of a project. The economic life of a project should not be longer than its technical life or its legal life; in other words, it must be less than or equal to the shorter of the two. For project planning purpose only the economic life is relevant. The economic life is the period over which the project would generate net gains and depends basically on the technical or technological life cycle of the main plant items, the life cycle of the product and of the industry involved, and the flexibility of a firm in adapting its business activities to changes in the business environment. When determining the economic life span of the project, various factors have to be assessed, some of which includes: duration of demand, duration of the raw material deposits and supply, rate of technical progress, life cycle of the industry, duration of building and equipment, opportunities for alternative investment, administrative constraints etc (Dayananda et al., 2002). Although theory advice to use the economic life of the project in forecasting cash flow, Pandey’s (1989) finding showed that most Indian companies chose a period of five to ten years for forecasting cash flow as most financing institutions requires 5 to 10 years forecast of the project cash flow in order to grant credit.

After determining the economic life as discussed above, there are two categories of forecasting techniques used for cash estimation. These are qualitative and quantitative techniques. Project analyst chooses either of these two methods for forecasting the cash flow for their project. The forecasting technique to be used rests up on each of the following factors: whether the project is new or old, whether data is sufficiently available and the skill and availability of technology (Dayananda et al., 2002). Quantitative forecasting techniques are techniques...
that use numerical analysis in the estimation of the future cash flow generated by the project. These techniques include simple and multiple regression, time series analysis and smoothing techniques. These techniques are relatively objective methods and are based on historical data. The limitation of these techniques is that, they are not flexible and do not consider the judgment and experience of the forecaster (Chandra, 2009). The other group includes qualitative techniques such as Delphi techniques, expert opinion, sales personnel estimate etc. These techniques are flexible and accommodate judgment and experience. The main limitation of these techniques is the subjectivity of the estimate (Chandra, 2009). Baker & Powell (2005) stated that in practice firms use several methods to estimate cash flow. Some firms rely on sophisticated mathematical models and computer simulation. Others use more qualitative methods to forecast cash flow including management subjective estimates and a survey of expert’s opinions. Large corporations often combine quantitative and judgment forecast to improve their estimates.

IV. RESEARCH DESIGN AND METHODOLOGY

As the objective of the study is to investigate the capital budgeting practice in Ethiopia, the research design adopted in this study was descriptive in nature. Survey questionnaire were developed and distributed to sample firms in Addis Ababa, Ethiopia in the year 2014. Stratified random sampling method was used in selecting the sample firms. First, about 900 large firms were identified from the data base of ministry of trade of Ethiopia, then using statistical model, 180 firms were selected for the study. Questionnaires were distributed to these 180 sampled business organizations out of which 109 usable questionnaires were collected back. These 109 samples firms were categorized in two ways for analysis purpose. 55 of these firms are engaged in industry sector such as manufacturing, construction, mining, agribusiness etc and the remaining 54 firms are engaged in service sector including finance, hotel and catering, education, transport and communication, etc. Based on ownership, again the organizations are categorized as private which includes 71 firms and state owned which include 38 firms. The data gathered were processed using the Statistical Package for Social Science (SPSS 20) and MS excel. Descriptive statistical tools, tables, and graphs were used in the analysis and presentation. In order to support the result obtained using survey, interview was conducted with six key informants from different organizations.

V. RESULT AND DISCUSSION

a) Link between Strategic Plan and Projects

In theory, setting corporate goal and preparing strategic plan to achieve the corporate goal is the starting point in capital budgeting. In line with this, firms under study were requested to indicate the practice of setting corporate goal & strategic plan and the establishment of capital budget in line with it. The question is in the form of likert scale, zero representing never at all and four representing always practiced. Taking the rate for most of the times or always together, the response from the survey is summarized in table 1 as follows.

<table>
<thead>
<tr>
<th>Items</th>
<th>Total</th>
<th>Ownership</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting corporate goal</td>
<td>3.00</td>
<td>77.1</td>
<td></td>
</tr>
<tr>
<td>Preparing strategic plan to achieve corporate goal</td>
<td>3.00</td>
<td>82.6</td>
<td></td>
</tr>
<tr>
<td>Establishing capital budget in line with strategic plan</td>
<td>3.00</td>
<td>85.3</td>
<td></td>
</tr>
</tbody>
</table>

Source: Survey data analysis

As one can see from table 1 above, in general, the majority of the firms set corporate goal, strategic plan and establish capital budget in line with the strategic plan most of the times or always. It is apparent that state owned firms are better in all aspect as compared to private firms. This is because state owned enterprises are required by ministry of public enterprises to prepare their vision, mission and five years strategic plan periodically and operational plan annually. It is also common to see the vision, mission, objectives and values posted on a billboard inside the compound of most state owned enterprises. However for private companies especially, small PLCs, such practices are not commonly observed. In addition, table 1 compares the practice in industry and service sector. From the result, firms in service sector seems better in setting corporate goal as compared to those in industrial sector. On the other hand firms in the industry sector seems better in the preparation of strategic plan and establishing capital budget in line with the strategic plan as compared to those in service sector. To identify the main objective of undertaking capital investment by the sample firms, respondents were requested to state the objective of capital budgeting in their firms. Figure 1 below reports the results of the survey for the firms under study.
As shown in Figure 1 above, it is clear that most firms in Ethiopia pursue multiple objectives. Although financial management books advocate the principal goal of financial management should be to maximize shareholders wealth, Chandara (2009) argued that in practice managers may pursue multiple objectives. This coincides with the reality in Ethiopian firms. Business organizations in Ethiopia pursue multiple objectives in the investment appraisal process. The finding of Anand (2003) on Indian firms and the finding of Almutairi et al. (2008) in Kuwaiti firms also found that firms in general pursue multiple objectives.

The bar chart in Figure 1 further vivid that, increasing market size or market share (56.9 percent), maximizing profit (56.0 percent) and growth (50.5 percent) are the three top preferred objectives. Maximizing shareholders wealth (43.1 percent), increasing outreach to customers (39.4 percent), and sustainability (31.2 percent) are the moderately preferred objectives. The detail analysis with respect to objectives shows a difference based on ownership type. For private firms, profit maximization, wealth maximization and increasing market share are the three major objectives in respective order. This is the natural characteristics of private business organizations and in agreement with corporate finance theory which advocates that the objective of corporate business organizations should be profit and wealth maximization. On the other hand, the result also reports that the three major objectives for state owned enterprises include growth, increasing market share and increasing outreach. This is in agreement with Raj (1977) argument in which public enterprises in least developed countries have other purposes to serve via their capital investments such as: development of an industry in a backward area, introducing a new technology or saving foreign currency. The theory of market liberalization and privatization also states that management of private firms usually focus on wealth maximization and state owned enterprises on the other hand will consider social consequences of their decision and profit maximization may not necessarily their grand objectives. With respect to sector wise classification, profit maximization is the dominant objectives of Industry sector business organizations but for Service giving businesses, increasing market share is their main objective.

b) Identification and Preliminary Screening

After setting corporate goal, strategic plan and objectives, the next step is investment idea generation in line with the objectives. A likert type question was presented to respondents to rate the existence of formal procedure for originating investment opportunity and the practice of screening viable projects. The result of analysis showed that, there is a formal process of identifying and screening investment ideas in the majority of the firms under study. The practice is better in private than in state owned firms and better in service giving than in industrial sector. Of course, such formal procedure depends on the nature of capital investment. For instance, such strict procedures may not be followed for replacement and purchase of fixed assets. The acquisition will be undertaken at any time if the need arise and the concerned manager is convinced.

A study by Hatfield et al. (2007) indicated that the source of project origination depends on the type of project. Project proposals can originate from managers, employees, customers, suppliers, competitive forces, trade magazines and bazaars. Many projects, such as replacement, capacity, quality and safety tend to come from the lower-level managers. Larger, strategic type projects originate from both upper-level and lower-level management. Since idea generation is the first and crucial step in the capital budgeting process, the study sought the answer as to who generates ideas for new capital investments. The result of the survey was summarized and presented in Table 2 below.
Table 2: Source of Investment Idea

<table>
<thead>
<tr>
<th>Source of Investment</th>
<th>Total</th>
<th>Ownership</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Private %</td>
<td>State %</td>
</tr>
<tr>
<td>Share Holders/Owners</td>
<td>32</td>
<td>40.8</td>
<td>7.9</td>
</tr>
<tr>
<td>Board of Directors</td>
<td>46</td>
<td>39.4</td>
<td>47.4</td>
</tr>
<tr>
<td>Top Managers</td>
<td>79</td>
<td>64.8</td>
<td>86.8</td>
</tr>
<tr>
<td>Lower Managers</td>
<td>25</td>
<td>14.1</td>
<td>39.5</td>
</tr>
<tr>
<td>Employees</td>
<td>20</td>
<td>15.5</td>
<td>23.7</td>
</tr>
<tr>
<td>Consultant Firms</td>
<td>5</td>
<td>5.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Research and Business Development unit</td>
<td>25</td>
<td>25.4</td>
<td>18.4</td>
</tr>
<tr>
<td>Government body</td>
<td>3</td>
<td>0.0</td>
<td>7.9</td>
</tr>
<tr>
<td>Customers</td>
<td>1</td>
<td>1.4</td>
<td>0.0</td>
</tr>
<tr>
<td>Competitors</td>
<td>1</td>
<td>1.4</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 2 above indicates that in majority of the total firms, top managers are the main source of investment idea for capital investment followed by Board of directors, shareholders or owners, lower level managers and research and business development unit in the respective order. Although some respondents stated that investment idea can come from employee, project owners, responsible government bodies and customers as well, the percentage is very low. This result makes it clear that investment idea generation in Ethiopia is top down, which means viable opportunity originate from the top management level and implementation will be undertaken by lower level managers and employees. This might in turn imply the extent of participation of the lower level managers and employee in the organizations’ matter is very low. This result is in agreement with the practice in Kenya, India, Jordan and Nepal. A study conducted in Kenya by Nyaga & Ambrose (2013) found out that board of governance and managers are major sources of investment proposal. The finding by Singh et al. (2012) showed that the majorities of the sample companies (72.41 per cent) in India have the origination of new investment proposals at central/head office level indicating control by the top management on such decisions. Further the result of a study in Jordanian companies by Khamees, et al. (2010) and the study by Dangol et al. (2010) in Nepal Company also showed top managements are the main source of investment idea.

In addition to individual effort to identify viable investment opportunity, different development agencies and organizations of the government will play great role in idea generation. According to an expert at ministry of public enterprises of Ethiopia, the ministry office may give investment idea to the public enterprises based on the government’s priority area and five year strategic plans such as the currently undergoing growth and transformation plan. In addition, the ministry office will prepare profile of public enterprise to be privatized in the near future and disseminate the information to potential investors through its quarterly news letter and annual magazine. According to the information obtained from Ethiopian investment commission, it makes survey of investment opportunities available in the country and disseminates investment profiles in its three publications which include a quarterly newsletter, named “investment review”, a biannually magazine and annual investment guide. The investment opportunities can also be released through the commission’s websites and investors, especially foreign investor will make use of this for their investment decision. In a bid to promote development of industries and attract customers, government owned financial institutions like construction and business bank and development bank of Ethiopia conduct studies, prepare feasibility reports and offer suggestions to potential entrepreneurs. The suggestions of these institutions are helpful in identifying promising projects.

In an attempt to cut costs and improve product quality, firms usually seek inputs of employee at all levels for new ideas. Many firms provide bonus to workers for their cost cutting suggestions and innovation. To assess the practice in Ethiopia, respondents were requested to rate about the existence of incentive system for investment idea generation in their firm. Taking a response rate of most of the times and always together as existence of incentive system, only about one-third of the firms under the study have the culture of giving incentives for new investment idea. The culture of giving incentive system is relatively better in industrial sector (38.2%) than in Service giving enterprises (25.9%). From ownership point of view, it is relatively better in private firms (38%) than in state owned firms (21%).

Business organizations undertake different kinds of capital investment. The survey sought the dominant type of capital investment undertaken by the respondent firms and it is presented in figure 2 as shown below.
Out of the different types of capital investment, most firms (84.4, 70.6 and 54.1 percent) indicated that purchase of fixed assets, expansion in new business and replacement of old fixed assets are the dominant capital investments under taken respectively. In addition, other significant percentage of respondents (41.3, 38.5, 26.6 and 19.3 percent) also indicated that investment in ICT, investment in new business, repair and maintenance and leasing are types of investment moderately undertaken in their firm respectively. Few firms have also indicated that investment in building and real estates, expansion of electric power projects and construction of warehouse and depot are the capital investment types undertaken in their firm widely. Figure 2 also indicates that firms undertake multiple capital investments at the same time.

Disregarding purchase of fixed asset which is common to all firms, this result mirrors the finding of Dangol et al. (2010) in Nepal firms in which expansion of existing project is ranked first. It is also in agreement with Danielson and Scott (2006) who found out that Projects to extend existing product lines are shown as the primary investment activity for most small firms in USA. Further, they have also found that the most important class of investments is ‘replacement’ for almost 50 percent of the firms. In Portuguese, Moutinho & Lopes (2011) reported that the three major types of investments are expansion of existing business (50%), modernization (39.6%) and substitutions (16.7%) projects which is similar with the practice in Ethiopia.

Once promising investment idea is generated, the next step is to undertake sound investment appraisal. The respondents were asked to identify which division or department has the responsibility for analyzing capital expenditure proposals. The responses to this question are summarized in table 3 below.

### Table 3: Responsibility for Capital Budgeting

<table>
<thead>
<tr>
<th>Responsibility for capital budgeting</th>
<th>Total</th>
<th>Ownership</th>
<th>Sector</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No %</td>
<td>Private %</td>
<td>State %</td>
</tr>
<tr>
<td>Finance department</td>
<td>64</td>
<td>59.2</td>
<td>57.9</td>
</tr>
<tr>
<td>Engineering department</td>
<td>15</td>
<td>8.5</td>
<td>23.7</td>
</tr>
<tr>
<td>Business dev’t unit</td>
<td>33</td>
<td>32.4</td>
<td>26.3</td>
</tr>
<tr>
<td>Separate Committee</td>
<td>15</td>
<td>14.1</td>
<td>13.2</td>
</tr>
<tr>
<td>External Consultant</td>
<td>11</td>
<td>14.1</td>
<td>2.6</td>
</tr>
<tr>
<td>Top managers</td>
<td>5</td>
<td>4.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Planning Department</td>
<td>30</td>
<td>16.9</td>
<td>47.4</td>
</tr>
<tr>
<td>The concerned department</td>
<td>20</td>
<td>15.5</td>
<td>23.7</td>
</tr>
<tr>
<td>Total</td>
<td>109</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total responses exceed the total number of samples, because some respondents selected more than one alternative, since the responsibility for capital budgeting analysis in their firm was shared among two or more departments. The

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involvement of many departments in capital budgeting process is due to the fact that capital budgeting is not the exclusive duty of financial officers and accountants. Rather, it is a multifunctional task linked to a firms’ overall strategy and other management functional area. However, the involvement of engineering department especially in the technical aspect of the capital projects is not as expected; which have an impact on the reliability and accuracy of the analysis made. In table 3 above, it is also apparent that in the majority of the firms, the responsibility for analyzing capital projects is that of the Finance Departments followed by business development and planning. Others such as, engineering department, the concerned specific department, separate committee, external consultant, top managers are also involved in the process to some extent.

From table 3, one can see that the involvement of external consultants is very limited. Information obtained from ministry of public enterprises also confirms that external consultants will be involved in feasibility study in government enterprise only if the cost of the capital investment is greater than 10 million birr. This might be because, there are already few state and private consulting firms that have for a considerable time been able to make pre-investment studies of all kinds and that participate actively in investment consultancy in the widest sense, rendering services in project management, engineering, construction supervision etc. The few existing consulting firms are also owing to the lack of suitable management and other staff, as well as because of inadequate experience, they are not yet able to provide internationally acceptable investment consultancy services. The limited involvement of external consultants in Ethiopia is also similar to the situation in Jordan. Khamees et al. (2010) found that above 71.2 % of the respondents do not seek help from external parties to analyze their capital budgeting decisions. These results indicate that the planning for capital expenditures depends to a large extent on the organization itself.

Detail analysis of the result revealed there are some variations among the different forms of business organization. The involvement of planning and engineering department is relatively more in state owned firms than private firms. This might be because; state owned firms are relatively well structured and have these specific departments. Based on sector wise classification, the involvement of external consultant is relatively better in industry sector where as the involvement of business development is relatively better in service sector.

In addition, respondents were also asked what motivates them to use sound capital budgeting analysis and what factors hinder them from making sound investment appraisal. The result is summarized in table 4 as follows.

<table>
<thead>
<tr>
<th>Table 4: Motivating and Discouraging Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Firm’s own policy</td>
</tr>
<tr>
<td>Competitors action</td>
</tr>
<tr>
<td>Government policy</td>
</tr>
<tr>
<td>Creditors such as Banks</td>
</tr>
<tr>
<td>Effectiveness of the process</td>
</tr>
<tr>
<td>Availability of technology</td>
</tr>
<tr>
<td>Availability of professionals</td>
</tr>
<tr>
<td>Missing system</td>
</tr>
<tr>
<td>Lack of skilled professional</td>
</tr>
<tr>
<td>High cost of the process</td>
</tr>
<tr>
<td>Lack of technology</td>
</tr>
<tr>
<td>Difficulty of the process</td>
</tr>
<tr>
<td>Lack of information</td>
</tr>
<tr>
<td>Market price variability</td>
</tr>
<tr>
<td>Missing system</td>
</tr>
<tr>
<td><strong>Total</strong></td>
</tr>
</tbody>
</table>

Table 4 shows that firms own policy (61.9 percent) is the dominant motivating factor. Competitor’s action (36.2 percent), government policy (31.4 Percent), creditors requirement (22.9 percent), effectiveness of the process (20.0 percent) are other factors that motivate to undertake investment appraisal. Availability of technology and qualified staffs have minor role in undertaking capital budgeting analysis. Especially, with regard to creditors’ requirement, some commercial banks like the stated owned commercial bank of Ethiopia has a guideline for loan application. One of the requirement for loan application in this
bank states that applicants should submit detailed feasibility study including financial appraisal made using discounted cash flow techniques such as NPV and IRR.

Furthermore, respondents were also asked to state principal reasons or problems that discourage them from undertaking detailed capital budgeting analysis. The most discouraging factor mentioned by respondents is lack of qualified staff which accounts 44.0 percent. Other factors mentioned include: high cost of the process (27.5 percent), lack of technology (13.8 percent), difficulty of the process (10.1 percent), and lack of information for analysis (9.2 percent). Out of the hindering factors ranked above, Lack of timely, reliable and relevant information is a serious problem mentioned by an expert from banking sector. Lack of up to date Information useful for project appraisal and data uncertainties were also indicated by pinches (1982) as serious problem. One interesting result that emerges from table 4 is that availability of qualified staffs is last under motivating factors and it is the first under discouraging factors which shows that respondents are consistent in answering the two opposite questions.

c) Forecasting Cash Inflow and Outflow

Cash flow forecasting is an important stage in the capital budgeting decisions. With this regard, respondents were asked to mention methods used to analyze the viability of capital projects. Close to 71% of the respondents’ use both project cash flow and accounting return in assessing the viability of projects. Opinion on cash flow forecasting practice in Ethiopia was also obtained from an expert from banking industry. The expert stated that if the project is to be partly or wholly financed by banks, cash flow analysis should be used to test the viability of the project and cash flow should be forecasted for a period of at least the number of loan repayment period. If the cash flow forecasted has an error in it, the final decision will be wrong whatever investment appraisal tools are applied. To assess the practice of cash flow forecasting, the study went on looking into the items included in the cash flow forecast and the methods being adopted in forecasting each of the cash flow components in Ethiopian firms.

<table>
<thead>
<tr>
<th>Table 5: Components of Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Initial cash outflow</td>
</tr>
<tr>
<td>Periodic cash flow</td>
</tr>
<tr>
<td>Working capital</td>
</tr>
<tr>
<td>Terminal cash flow</td>
</tr>
<tr>
<td>Inflation</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Forecasting Methods</td>
</tr>
<tr>
<td>Past performance</td>
</tr>
<tr>
<td>Quantitative techniques</td>
</tr>
<tr>
<td>Qualitative techniques</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

As can be observed from table 5 above, only moderate numbers of firms properly incorporate the different cash flows in the cash flow estimation. Although the detail of cash flow was not asked, this result suggests that firms omit some important cash flow components or unnecessarily incorporate irrelevant costs. This is in line with the finding in India. Pandey (1989) also found that Indian firms did not always have clarity about estimating cash flows. Half of his sample companies did not include additional working capital while estimating the investment project cash flows. A number of companies also mix up financial cash flows with operating cash flows.

In addition, table 5 above shows that the majority of the respondent companies apply past performance and quantitative techniques to forecast cash-flows. Very small portion of the respondents also apply qualitative techniques such as expert opinion. This result coincides with the finding by Jog and Srivastava (1995) where most of the Canadian firms used quantitative methods for cash flow forecasting, it was then followed by the methods of management’s subjective estimates and consensus of expert’s opinions. However, the result in this study contradicts with the finding in Nepal where most manufacturing firms used qualitative techniques such as management judgment (Dangol et al., 2010). Interview with an expert in consultancy firms also revealed that they will use quantitative statistical techniques such as double exponential smoothing and trend extrapolation techniques in forecasting cash flow of project for the preparation very big project feasibility study.

In theory, the time horizon for cash flow analysis should be the minimum of the physical life of the plant asset, technological life of the plant asset, product market life of the plant asset or investment planning horizon of the firm. However, banks in

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Ethiopia require cash forecast at least for the number of years of loan repayment period. According to Chandara (2009), the requirement for Indian banks is cash forecast for a minimum of 10 years. In Australia, Truong et al. (2006) found that the length of the cash flow forecast period varies from less than three years to more than ten years, but 5 to 10 years is the most common forecast interval (43%).

The sample firms are requested to respond on the practice of their firm with respect to adjustment for inflation and incorporation of depreciation tax advantage in cash flow forecasting. The result of the study indicates that only 10.1% of the respondents incorporate inflation “always” when forecasting cash flow and this becomes about 41% when “most of the times” is added to it. With regard to depreciation, only about 25.5% incorporate depreciation tax shield “always” in forecasting cash flow and this grows to 50% when “most of the times” is added. Similar to this result, Coline and Mike (1997) also found that significant number of firms incorrectly treat inflation as a result of which many profitable projects are being rejected. However, the practice in south Africa is better as compared to Ethiopia where about only one quarter of the firms were not making adjustment for inflation in their capital budgeting analysis (Hall, 2009).

VI. CONCLUSION & IMPLICATION

Most firms formulate their corporate goal & strategic plan and establish capital budget in line with it. Further, business organizations pursue multiple goals and there is a variation in goals between private and state owned firms. The goal of most private firms revolve around profit and wealth maximization where as the goal of state owned firms focus on growth, increasing market share and increasing outreach to customers. This is in line with the natural behaviour of private and state owned firms indicated in theory. However, most of them do not have capital budgeting manual specifically prepared for their company. They use the one developed by EIC, Ministry of public enterprises or UNIDO.

Most capital budgeting related decisions are made by top managers and board of directors. Top managers and board of directors are the main source of investment idea in the selected firms also. There is no significant variation among the different types of business organizations in terms of origination of investment opportunity. Only one-third of the firms have an incentive system for generating profitable investment idea. In addition, most strategic decisions such as approval and post audit are made by board of directors and top managers of the firms. This indicates that, origination of idea is top down and participation of common employees in critical decisions is very less in the majority of firms. The implication of this is that, the majority of Ethiopian companies are treated as business units instead of standalone firms and critical decision falls in the hand of high ranking authority. This has significant corporate accountability, resulting in formal and lengthy decision-making procedures.

The majority of the firms undertake different kinds of investment and feasibility study is mainly a group work. The most common types of investment in the sample firms include purchase of fixed asset, expansion of existing business, replacement projects, investment in ICT and investment in new business. Although the majority of them do not have minimum cut-off amount above which formal capital budgeting analysis is required, rigorous appraisal is not needed for purchase of ordinary fixed asset and replacement activities. Further, capital budgeting is not only the duty of the finance manager. Business development and planning departments are also involved in capital budgeting analysis. However, the participation of engineering department and use of external consultant is limited which obviously have negative implication on the reliability of the analysis made.

Firms have also indicated motivating and hindering factors in making investment appraisal. Firms’ policy, competitors’ actions, and banks requirements are the main pushing factors for making sound capital budgeting analysis. Lack of skilled professional, high cost of the process and lack of technology are the most serious hindering factors in making capital budgeting analysis. It seems that, there are two main reasons behind the pitfalls in evaluating the capital projects of the firms. The first reason is the unfamiliarity with the different techniques used to evaluate those projects. The second is the lack in staff, time, and experience to formally deal with capital budgeting expenditures.

The majority of the respondents use both project cash flow and accounting return in assessing the viability of their project and most of them use both quantitative techniques and past performance in forecasting cash flow. On the other hand, it appears that there are some misapplications. The different components of cash flow are not included properly and the period of forecasting mainly depends on period of loan repayment instead of economic life. There are significant numbers of firms that do not consider impact of inflation and tax properly when forecasting cash flow. On the one hand, firms do not totally abandon accounting measures and on the other hand, they are not properly calculating the cash inflow and outflow which implies that firms might not be properly applying cash flow concept in capital budgeting analysis.

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Effects of Temperature and pH on *Trichoderma reseei* Cellulase Activity in Glucose Production from Watermelon Peel

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**Abstract**- Optimal enzyme activity occurs within a limited set of conditions such as temperature and pH which must be carefully controlled to promote high reaction rates. Therefore, watermelon peel was collected, processed, pretreated and subjected to hydrolysis in a series of batch reactors. *Trichoderma reseei* was isolated from decayed wood and the enzymes released by *Trichoderma reseei* were used for the hydrolysis for glucose production from watermelon dry peel. The effects of temperature at selected temperatures of 20 °C, 25 °C, 30 °C, 35 °C, 40 °C and 45 °C; as well as effects of pH on enzyme activity at selected pH ranges of 3.0 to 5.5 were studied. From the study, the results obtained within the limit of the experimental conditions show an optimal temperature of 30 °C, having a corresponding glucose concentration of 0.091728 g/l, optimal pH of 4.5 with a corresponding glucose concentration 0.6436 g/l, which implies that the enzymes from *T. reseei* gives high yield of glucose when controlled at these conditions. Also, the watermelon dry sample used in the study was highly delignified, leading to high glucose yield.

**Index Terms**- Waste, Fruits, Hydrolysis, Biomass, Concentration, Environment

I. **INTRODUCTION**

Waste is defined as any unavoidable material resulting from domestic activity or industrial operation for which there is no economic demand and which must be disposed off (Sridhar and Hammend, 2014). In developing countries, where there is high degree of poverty and hunger; ignorance and negligence are major factors contributing to the contamination of the environment through indiscriminate disposal of wastes. As the world’s population grows, production of waste materials also increases proportionately (Ososanya, 2012). In Nigeria, Agricultural Post-Harvest waste, vegetables and fruit peels form a major part of these wastes. This is because; fruits like banana, cucumber, watermelon, pineapple and the rest are not eaten with the peels. Often a times, these peels from the aforementioned fruits and certain parts of the vegetable which are common in Nigeria are regarded as waste with no value and are often thrown away littering the environment or may be fed to animals. If well harnessed, these peels which are hitherto regarded as waste can be enzymatically hydrolyzed to produce bio-energy (Oladeyo, 2010). One of the most pre-dominant fruit and the most common fruit in Nigeria, particularly in the North east is watermelon. Watermelon comes from the cucurbit family; a warm season crop which is usually cultivated in the warmer parts of the world as Africa and Asia. The fruit constitutes 68% flesh, the rind 30% and the seed 2% of the total weight (Kumar et al., 2012). Studies conducted by Abdulla and Masudal (2015), revealed that dry watermelon peel contains 73.8 % carbohydrate from which bio-energy can be produced. *Trichoderma reseei*, a haploid filamentous fungus has the ability to produce Cellulase enzymes which can be used for conversion of plant biomass into glucose. Enzyme performance is typically tested or assayed to determine their optimal activity based on variation of environmental factors affects enzymes physical and chemical properties such as temperature and pH. Optimal enzyme activity occurs within a limited set of conditions and must thus be carefully controlled to promote high reaction rates (Obnamia, 2014).

The objective of this work is to investigate the effects of temperature and pH on *T. reseei* Cellulase activity and to determine the appropriate conditions (pH and temperature) for optimal enzyme activity for achieving high glucose yield in glucose production from watermelon peel.

II. **METHODOLOGY**

Watermelon fruit used was procured from Gomboru market, Custom area of Maiduguri, Borno State, Nigeria for the study. The peels were removed and transferred to the laboratory in a sterilized polyethylene bag, where they were dried in an oven at 50°C for 1 hour and stored in an air-tight plastic container. The equipment used in this work include: Electronic precision balance (Model Tl-5000), Water bath (Techmel and Techmel TT420), pH meter (Jensway 3150), Incubator (Gallenkamp 1EF097 XX2.5), Light microscope (Olympus Venox-T Model), Micro pipette, pasture pipette, Conical flask (pyrex), Measuring cylinder (pyrex), Petri dishes, 4 roll Cotton wool, one role Aluminium foil, Slide and cover slip, (1pack each), Autoclave (New life medical instrument England, Model 280-A), Glucose lab kit (Chemelex), Hotbox oven (BFL 300-749-I Borel Laboratory), Muslin clothe, Spectrophotometer.

The following samples were collected for isolation of the fungi: decaying wood, termite housing soil (THS), maize grain (MG), sorghum grain (SG), millet grain (MLG), cowpea seed and deteriorated groundnut seed were procured from Custom Market in Maiduguri, Borno State, Nigeria. The samples were carefully collected in sterilized container with a cover, labeled and transferred to the laboratory for analysis.
Trichoderma reseei mycelia that were used throughout the study were cultured in the Pathology Laboratory of the Department of Crop Production, University of Maiduguri. Potato Dextrose Agar (PDA) was used as the media for isolating the organism. The PDA used is composed of potatoes, infusion from 4.0g (200g of potatoes extract is equivalent to 4.0g of potatoes infusion), D (+) glucose 20.0g, Agar-agar 15.0g. Demineralized water was prepared by boiling water in a current autoclave at 121 °C for 15 minutes, after 39g of the PDA, measured on an electric precision balance was suspended in 1 liter demineralized water in a 1000 ml flask. The orifice of the flask was covered with cotton, wrapped with aluminium foil. Petri dishes, wrapped with aluminium foil were sterilized by autoclaving for 20 minutes at the pressure of 0.14-0.16 Mpa and temperature of 121 °C. The flask containing the media was heated to obtain completely dissolved media. The content of the media was allowed to cool to 45 °C as given in Figure 2.

**A. Media Preparation**

**B. Plate Preparation and Pouring**

Petri dishes with cover were washed in a 10% commercial bleach for 5 minutes after which they were washed with detergent and rinsed under running tap. The Petri dishes were then placed on a table, sterilized by swabbing with ethanol to avoid contaminations. The petri dishes were then sterilized in a hot oven at 150 °C for 90 minutes. The mouth of the conical flask containing the medium in Figure 2 was flame-sterilized by using a spirit lamp to destroy surface micro-organisms. Two drops of lactic acid were poured into each of the petri-dishes to inhibit the growth of bacteria and then the medium was poured and covered, and left to solidify as given in Figure 3.

**C. Isolation of Organism**

Sample collected were divided into two batches, with equal number and same sets of samples (i.e. each batch consisting of six samples, namely: decayed wood, termite housing soil, maize grain, sorghum grain, decayed groundnut seed and cowpea seed). The first batch was surfaced sterilized in 10% commercial bleach in a petri dish to destroy secondary pathogens and rinsed with distilled water while samples in the second batch was left surfaced unsterilized. Flame sterilized forceps was used to pick five pieces per sample from the two batches of samples and transferred to the PDA medium aseptically by swabbing the work bench with alcohol. The petri dishes were then incubated at a temperature between 28°C-30°C for 72 hours, and the growth of micro-organism was monitored.

**D. Slide Preparation**

Drop of Lactophenol cotton blue was placed on a clean glass slide and a small portion of the fungalmycelium was gently taken from the culture and placed in the drop of Lactophenol using a flame sterilized teasing needle; the mycelium was carefully spread on the slide with the aid of the inoculating needle. A cover slip was then gently applied with little pressure to avoid the trapping of air bubbles in the stain. The slide was covered with a slip and heated slightly to remove air bubbles and the slide was then mounted and examined under a light microscope (x10 and x40), and the colony morphological characteristics of *T. reseei* were identified.

**E. Sub-Culturing of *T. reseei***

Inoculating needle was sterilized by flaming in the blue portion of spirit lamp until it is red and dipped in alcohol to cool, and was used to carefully transfer a tuft of the isolated *Trichoderma reseei* to a sterile PDA plates by point inoculation. Pure cultures were maintained by sub-culturing onto freshly prepared PDA routinely, and kept at 28°C in an incubator as a stock culture.
F. Mechanical Pretreatment

The dried watermelon peel (100g) was milled or grinded using electric grinding machine to powder after which it was sieved using 100µm sieve size to obtain fine powder so as to increase the area/volume ratio. The peel powder was then collected and kept in a sterilized container with a cover as given in Figure 4.

G. Chemical Pretreatment

Fifty gram (50g) of the milled watermelon rind was mixed with 20 ml of 10% sulfuric acid (H₂SO₄) at room temperature in a 1 liter beaker with constant stirring for 2 minute to delignify the substrate. The sulfuric acid was then separated from the substrate by filtering through a muslin cloth. The substrate was then washed three times with distilled water to remove the residual acid from the watermelon peel. It was then oven dried to a constant weight at 50 °C.

H. Preparation of Mineral salt Media

Peeled Irish Potato (200g) was chopped into small pieces and added into 1 liter of sterilized distilled water and boiled gently at 60 °C after which it was filtered through muslin cloth into a 1 liter conical flask. 3g of sodium acetate and 0.5g of magnesium sulfate were added to the peeled potato extract in the 1 liter conical flask forming a mineral medium. Then 0.5g and 27g of sodium chloride and glucose also were added respectively to the medium. Again 0.5g each of calcium chloride and potassium sulfate were then added. The mineral salt medium formed is given in Figure 5.

I. Acetate Buffer Preparation

Solution A (sodium acetate trihydrate) was prepared by adding 13.60 g of sodium acetate trihydrate \((\text{CH}_3\text{COONa}.3\text{H}_2\text{O})\) into 1000 ml of deionized water and solution B (acetic acid) was prepared by adding 5.80 ml of acetic acid\((\text{CH}_3\text{COOH})\) into 100 ml of deionized water and then the solution was brought to 1000 ml. Each of the solution is of 0.1 M concentration. The various desired pH values were obtained by adjusting with either 0.1 M of solution A or B.

J. Assays for Glucose Concentration

The reducing sugar (glucose) concentration analysis in all the experimental runs was carried out using a glucose oxidase-peroxidase labkit (GOD-PAP). A micro-pipette was used to collect 1000 μl of the sample and was mixed with 1 ml of the reagent. The solutions were then placed on a cycling vibrator for 5 minutes to homogenize the mixture after which it was incubated for 25 minute at temperature of 20 °C. Measurement of absorbance of the standard \(A_{\text{standard}}\) and sample \(A_{\text{sample}}\) was done against the reagent blank within 60 minute at a wave length of 546 nm.

K. Effect of Temperature and pH on T. reseei Cellulase Activity

To obtain an improved rate of hydrolysis, watermelon peel powder was pretreated with sulfuric acid solution to expose the cellulose to the enzymes to attack. In a typical run, the temperature of the water bath was set at selected temperatures of 20 °C, 25 °C, 30 °C, 35 °C, 40 °C and 45 °C. Batch reactors made of plastic containers were used, where 50ml of mineral salt, 1g \(T. \text{reseei}\) mycelium and 1.5g of pretreated watermelon peel were added into each of the reactors. Other reaction conditions such as pH and culture age were kept constant at 4.5 (Sodium Acetate, Trihydrate Buffer) and 5days respectively. For the effect of pH on \(T. \text{reesie}\) Cellulase activity, selected pH ranges from 3.0 to 5.5 were used while other conditions such as temperature, cell loading, substrate concentration and culture age were held constant at 30 °C, 1g, 20g/l and 5 days respectively. Optimal temperature and pH for the hydrolysis were evaluated by analyzing the concentration of glucose produced at different temperature and pH levels. The glucose produced was determined at 24 hours interval, using glucose oxidase-peroxidase lab kit (GOD-PAP) and a Spectrophotometer. Each run was repeated two times and the mean value was reported.
III. RESULTS AND DISCUSSIONS

The microorganism *T. reseei* was identified and the morphological features of the organism. To obtain an improved rate of hydrolysis, watermelon peel powder was pretreated with sulfuric acid solution. Figure 3 shows the effect of the chemical pretreatment carried out on watermelon peel powder in glucose production. From the Figure, it can be inferred that high delignification was obtained on the treated sample and likewise the hemicelluloses were well broken which led to the exposure of the cellulose to the enzymes to act upon, yielding to higher glucose production of 0.89347 g/l in the treated sample and 0.19715 g/l in the untreated sample after 168 hours.

![Figure 3: Effect of Pretreatment on Watermelon Peel Hydrolysis](image)

Keeping temperature, substrate concentration and mycelium cell loading constant, the effect of pH on the enzyme activity from *Trichoderma reseei* at different pH values is depicted in Figure 5. Enzyme activity increases as pH increases from an acidic environment, reaches a maximum (optimal pH) of 4.5 with a corresponding glucose concentration of 0.6436 g/l and decreases towards a basic environment as the pH of the batch reactor rises to 5.5, where enzyme activity became deactivated as described by Obnamia (2014). Similar result was obtained by Ososanya (2012).

![Figure 4: Micrograph of *T. reseei* (x400)](image)
The effect of temperature on the activity of enzymes from *T. reseei* was studied at various temperatures: 20 °C, 25 °C, 30 °C, 35 °C, 40 °C and 45°C. This was done to determine the optimum temperature for glucose production. Enzymes activity increases between 20 °C to 35 °C with an optimum activity at 30 °C. This was followed by a corresponding decline in the enzyme activity as the temperature rises above 30 °C. This was because; at high temperature the enzyme was denatured which lead to lost of structural integrity. Similar report was given by Samuel et al., (2002) and Hui (2013), where they reported that majority of *Trichoderma* cultures grow rapidly between the temperature of 25 °C to 35 °C and not growing at all at 35 °C, yet some species grow at 35°C.

Figure 6: Effect Temperature on Glucose Production from Watermelon peel

Figure 7 and 8 shows the composite effect of temperature and pH on *T. reseei* Cellulase activity in glucose production from watermelon peel.
From figure 7, it can be inferred that glucose concentration was at the maximum of 0.1402 g/l in the 24th hour at 35 °C and gradually decreases to 0.04353 g/l in the 120th hour at the same temperature. Also, high glucose concentration of 0.27145 g/l was produce in the 48th hour at 30 °C which gradually decreases to 0.04005 g/l in the 72 hour at same temperature. High enzyme activity was observed between the temperatures of 20 °C to 35 °C. From Figure 8, it can be seen that high glucose concentration was found in the reactor with pH of 4.5, followed by the reactor with pH of 4.0. Maximum enzyme activity was observed in the 120th hour at pH of 4.5. Enzyme activity generally decreases as time increases because substrate concentration decreases.

IV. CONCLUSION

The effect of pretreatment, temperature and pH in glucose production using T. reesei fungus was investigated. It was shown that high delignification was achieved by pretreating the sample and as result the hemicellulose were well broken which led to the exposure of the cellulose for the enzymes to act upon, yielding higher glucose production from watermelon dry peel. The effects of temperature at 20, 25, 30, 35, 40 and 45 °C as well as the effects of pH on enzyme activity at pH of 30 °C with corresponding glucose concentration of 0.6436 g/l.
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Physico-chemical and microbial analysis of steel industry effluent

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Abstract- Industrial wastewater is enormously utilizing in irrigation worldwide. It is well known that physico-chemical and biological properties of wastewater influence the plant growth. In the present study, we have investigated the physico-chemical and biological properties of steel industry, Heavy Engineering Corporation Ltd. (H.E.C.) effluent. We found that most of the physico-chemical parameters were comparable to the BIS (The Bureau of Indian Standards) value for irrigation. However, conductivity, sulphate, B.O.D and C.O.D were higher than BIS value for irrigation. Moreover, microbial population was found to be higher in H.E.C. effluent as compared to tap water.

Index Terms- Heavy Engineering Corporation Ltd. (H.E.C.) Effluent, Wastewater, The Bureau of Indian Standards (BIS), Biological Oxygen Demand (B.O.D) and Chemical Oxygen Demand (C.O.D).

I. INTRODUCTION

In recent time industrial wastewater is enormously using for irrigation to recycle the water as well as utilizing it as fertilizer (Hussain, Raschid et al. 2001; Khurana and Singh 2012). This practice is more common in area where growing population economy is dependent on agriculture and simultaneously water scarcity increasing (Pescod and Arar 2013; Sato, Qadir et al. 2013). However, there are several considerable caveats for direct use of industrial wastewater in irrigation. Including advantageous nutrients industrial effluent also contains several hazardous chemicals and infectious microorganisms which could compromise and most often toxic for plant growth (Nagajyoti, Lee et al. 2010; Naidoo and Olaniran 2013; Chibuike and Obiora 2014; Balkhair 2016). Sometimes, higher amount of advantageous nutrients also inhibits the development of plant (Tchounwou, Yedjou et al. 2012; Chibuike and Obiora 2014). There are several reports which have reported the beneficial outcome of effluent in irrigation but simultaneously showed the lethal impact on plant growth (Shevah 2009; Khurana and Singh 2012; Lenin, Mariyappan et al. 2014; Ravindran, Kumari et al. 2016). Whether effluent would be beneficial or harmful for plant development is completely depends on their physico-chemical and biological characteristics (Chauhan 2014; Divyapriya, Dimi et al. 2014; Benit and Roslin 2015). If these properties are favorable for plant than it would be beneficial but if parameters are under or over the tolerance limit, then growth of plant will be compromise. Therefore, systematic analysis of specific effluent is required to know their suitable concentration for irrigation.

In this study, we investigated the physico-chemical and biological characteristics of steel industry, Heavy Engineering Corporation Ltd. (H.E.C.) effluent. H.E.C. effluent is commonly using as source of water for agriculture near their flow regions in Jharkhand, India. H.E.C. effluent not only provides water for irrigation but also contains important nutrients which are required for plant growth. Therefore, farmer use H.E.C. effluent to get nutrients for plant growth which economically overcomes the cost problem associated with fertilizers. Effluent could be harmful if their physico-chemical and biological parameters are not optimum for specific plants. Thus, it is worth to systematically analyze the physico-chemical and biological parameters of H.E.C. effluent to better understand their properties.

II. MATERIALS AND METHODS

H.E.C. effluent was collected at regular interval of six months from the H.E.C. plant Ranchi, Jharkhand, India. APHA procedure was used to analyzed the physico-chemical properties of H.E.C. effluent (APHA 1995). In this study we analyzed various physico-chemical parameters such as temperature (°C), TDS (ppm), turbidity (NTU), pH, conductivity (µ℧), alkalinity (meq./l), hardness (mg/l), chloride (mg/l), phosphate (mg/l), sulphate (mg/l), nitrate (mg/l), BOD (mg/l) and COD (mg/l). All the experiments were performed in quadruplicate and data were expressed as average value. Further microbial examination of H.E.C. effluent was performed. For this, different dilutions (0%, 20%, 40%, 60%, 80% and 100%) of H.E.C. effluent were prepared using distilled water. We spread one milliliter of different dilutions of H.E.C. effluent (0% - 100%) as well as tap water (control) on nutrient agar medium (NAM) plate and incubated at 37°C for a day. We visually scored the colonies that were grown on plate after incubation. Simultaneously, we also analyzed their phenotypic characteristic appearance such as colour.

III. RESULTS

Systematic analysis of different physico-chemical properties of H.E.C. effluent

H.E.C. effluent was collected four-times after interval of six months and their different properties of physico-chemical analysis were performed. H.E.C effluent colour was not uniform and varies with time of collection. Colour of the effluent was found to be light green, grey, transparent and brown in first,
second third and fourth collection time, respectively. Likewise, H.E.C. effluent odour was also varies with time of collection and it was musty in first, greasy in second and fourth and no smell in third collection time.

The average value of physical and chemical properties of H.E.C. effluent greatly varies as compared to standard recommended value of BIS for irrigation (table 1). H.E.C. effluent temperature (°C), TDS (ppm) and turbidity (NTU) were found to be 24.75 (BIS, 40), 299.25 (BIS, 2100) and 27.55 (BIS, 510) respectively. H.E.C. effluent pH, conductivity (µΩ) and alkalinity (meq./l) were found to be 7.07 (BIS, 6.0-9.0), 405.75 (BIS, 400), and 200 (BIS, 200-600), respectively. H.E.C. effluent hardness (mg/l) and Chloride (mg/l) were 236.75 (BIS, 300-600) and 45.54 (BIS, 600), respectively. The content of phosphate (mg/l), sulphate (mg/l) and nitrate (mg/l) in H.E.C. effluent values were 1.03 (BIS, 5), 167.5 (BIS, 150), and 25.5 (BIS, 50), respectively. Moreover, BOD (mg/l) and COD (mg/l) of H.E.C. effluent was found to be 52.25 (BIS, 30) and 271.75 (BIS, 250), respectively. These analyzed results indicate that most of the characteristic parameters of H.E.C effluent were comparable to the BIS recommended value for irrigation.

Table 1. Quantitative analysis of physico-chemical properties of H.E.C effluent collected on four different time points.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Average Value</th>
<th>BIS Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°C)</td>
<td>24.75</td>
<td>40.0</td>
</tr>
<tr>
<td>Turbidity (NTU)</td>
<td>27.55</td>
<td>510</td>
</tr>
<tr>
<td>TDS (ppm)</td>
<td>299.25</td>
<td>2100</td>
</tr>
<tr>
<td>pH</td>
<td>7.07</td>
<td>6.0-9.0</td>
</tr>
<tr>
<td>Conductivity (µΩ)</td>
<td>405.75</td>
<td>400</td>
</tr>
<tr>
<td>Alkalinity (meq./l)</td>
<td>200</td>
<td>200-600</td>
</tr>
<tr>
<td>Hardness (mg/l)</td>
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<tr>
<td>Chloride (mg/l)</td>
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<td>600</td>
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<tr>
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</tr>
<tr>
<td>Nitrate (mg/l)</td>
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<td>50</td>
</tr>
<tr>
<td>BOD (mg/l)</td>
<td>52.25</td>
<td>30</td>
</tr>
<tr>
<td>COD (mg/l)</td>
<td>271.75</td>
<td>250</td>
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</table>

Microbial analysis of H.E.C. effluent

Wastewater could contain microorganisms and their population completely depends on origin of source. Pathogenic microorganisms infect the plant and thus affect their development and growth. Thus, we examined the microbial population of H.E.C. effluent and compared their number of colonies with tap water. We found that number of microbial colonies were higher in 100% concentration H.E.C. effluent as compared to tap water (table 2). Total number of colonies forming unit per milliliter (CFU/ml) was approximately 1300 in 100% concentration H.E.C. effluent however it was approximately 400 CFU/ml in tap water. CFU was gradually decreased with lowering the concentration of H.E.C. effluent which is simply an outcome of dilution. Moreover, colony colour was varies at different concentrations of H.E.C. effluent. Colonies were appeared as white, blue and yellow in colour suggesting the mixed population of different groups in H.E.C. effluent (table 2). These results reveal that H.E.C. effluent contain different microorganisms than tap water however their number is less at lower concentrations (20% - 40%) of H.E.C. effluent.

Table 2. Microbial analysis of H.E.C effluent at different dilutions.

<table>
<thead>
<tr>
<th>H.E.C. effluent concentration</th>
<th>CFU/ml</th>
<th>Colony colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap water</td>
<td>400 - 500</td>
<td>White</td>
</tr>
<tr>
<td>20%</td>
<td>100 - 150</td>
<td>White, yellow, blue</td>
</tr>
<tr>
<td>40%</td>
<td>300 - 350</td>
<td>White, yellow</td>
</tr>
<tr>
<td>60%</td>
<td>700 - 800</td>
<td>White, yellow, blue</td>
</tr>
<tr>
<td>80%</td>
<td>1000 - 1100</td>
<td>White, yellow</td>
</tr>
<tr>
<td>100%</td>
<td>1300 - 1400</td>
<td>White, yellow</td>
</tr>
</tbody>
</table>

IV. DISCUSSION

Previously, we have reported the effect of H.E.C. effluent on morphological development of *Vicia faba* (Naaz, Swaroopa et al. 2017). We found that development of different morphologies of *Vicia faba* was maximum at lower H.E.C. effluent concentrations (Naaz, Swaroopa et al. 2017). In the present study, we have systematically analyzed the physico-chemical properties of H.E.C. effluent. Moreover, we also analyzed the microbial load in H.E.C. effluent. We found that most of the common physico-chemical parameters such as temperature, pH, turbidity, salinity, hardness, chloride, alkalinity, T.D.S, phosphorous and nitrogen were within the BIS recommended range. However, conductivity, sulphate, B.O.D and C.O.D value were slightly higher than the BIS recommended range. The increase in conductance of effluent could correlate with increase in sulphate concentration in H.E.C effluent. If sulphate combines with an alkaline metal the salt that forms may be able to conduct electricity, because of the cations and anions. Increase in B.O.D and C.O.D reveal that there is increase of microbial load in H.E.C. effluent (Aslam, Baig et al. 2004; Popa, Timofti et al. 2012; Benit and Roslin 2015). Indeed, we found that H.E.C. effluent contains several microorganisms of different phenotypic characters.
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Dowry System in India

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Abstract - Practice of dowry poses heavy threat to the life of females. Dowry is an age old practice in Indian society referring to property or valuable security given by one party to another as a consideration for marriage. The origin of dowry primarily was the contribution of wife's family or by herself with the intention to help the husband. This custom of dowry was started in the medieval period. Women were gifted with wealth and jewel from their parents during her marriage and this served as a tool of financial independence for the bride even after marriage. This menace is the root cause of almost all violence against a married woman. In most cases after marriage the problem of dowry will arise. If the wife is not able to provide all, which her husband and in laws demand, her life in the groom's house become miserable. She will be treated cruelly and in some cases she may lose her life.

Index Terms - Dowry, Dowry deaths, India, Marriage, Women

I. INTRODUCTION

The problem which Indian society still suffers is cruelty against women is based on dowry; domestic violence against women in India has its root at the demand of dowry. Dowry may happen in any families there is no difference between rich, middle class, poor, educated or uneducated. When a marriage is fixed no one is worry as to how clever, intellectual, and homely the girl is, but all that matters is, how much money and luxuries will she get to husband's home. With the passage of time dowry became a customary part in Indian society and became demanding dowry as their right in order to marry a woman, and gradually the dowry became violence to women when the groom's family didn't get enough dowry, resulting in harassment or cruelty of brides and also dowry deaths, especially in certain parts of India. Dowry demands affect the lives of females socially, economically and culturally.

According to the definition of dowry under section 2 of the Dowry Prohibition Act 1961 it is clear that dowry is a property which woman brings to her husband at marriage and includes the land, all sorts of properties, valuable securities given or agreed to be given directly or indirectly at the time of marriage. The term dowry does not include repayment of marriage expenses. The term dowry does not include Mahr.

II. HISTORICAL BACKGROUND OF DOWRY SYSTEM

Dowry or Kanyadanam is an important part of Hindu marital rites. Kanya means daughter and danna means gift. The custom of Kanyadaan (giving daughter in marriage) followed by Varadakshina (gift to the bridegroom at the time of marriage) may have given increase to dowry. It is in the Rig Veda that one comes across the concept of Kanyadaan. It was a custom in ancient times to give dakshina (obligatory gifts) after any kind of daan (voluntary gifts), hence the tradition of varadakshina following kanyadaan. It is said that Rishi Karva gave a number of gifts to his daughter, Shakuntala, when she married king Dushyant. It can be guessed that, since child marriages was the norm in ancient India, the parents may have given numerous gifts to the girl as she left her maternal home. Nevertheless dowry as it now exists, includes the extraction of cash and material goods from the bird's parents by the groom and his family. This social disease has spread through the range of society crossing religious and economic
limitations. Furthermore, dowry demands are made not only prior to the marriage, but also for years afterward, for instance, at the time of centenaries and the birth of children. Demands

The first national legislation to deal with the problem of dowry is the dowry prohibition Act 1961 with the main motive to prohibit the heavy demand in dowry; government introduced the Dowry Prohibition Act on 1st July 1961. Unfortunately, the dowry system is still widespread in India despite the provision in the Dowry Prohibition Act 1961.

According to section 3 of the dowry prohibition Act 1961, the Act prohibits the demand, payment or acceptance of a dowry, as consideration for the marriage, where dowry defined as a gift demanded or given as a precondition for a marriage. So asking or giving of dowry is punishable by an imprisonment of up to six months, a fine of up to fifteen thousand rupees or the amount of dowry, whichever is more, or imprisonment up to five year. It replaced several parts of anti-dowry legislation which had been enacted by various Indian states. However in accordance with section 3 of this Act, both the giver and receiver are pursued to rom potential harassment by the husband and his relatives.

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A) Dowry Death and Suicide

. Where the death of a woman is caused by any burns or bodily injury or happens otherwise than under normal circumstances within seven years of her marriage and it is shown that soon before her death she was subjected to cruelty by her husband or any relative of her husband for or in connection with the demand for dowry, such death shall be called 'dowry death', and such husband or relative shall be deemed to have caused her death. The Dowry Prohibition Act goes to the utmost limit of creating criminal offence to prescribe the giving or taking of dowry as a consideration for marriage or demanding or abetting the same. The statute intended to eradicate the kind of corruption and commercialization of the concept of dowry. So the definition under the Act was, therefore, moulded to the peculiar object of nipping the extortionate evil in the bud.[1]

mention in the oldest of Hindu scriptures and is continued today with a greater zeal. In the case of Kunju Moideen v. Sayed Mohamme, amount paid by Mohammedan in connection with daughter's marriage, to future bridegroom for buying of property in joint names of daughter and would be son-in-law is not 'dowry' within the meaning of section 2. Therefore, the giving or taking of property or valuable security must have some connection with the marriage of the parties and a relation between the giving and taking of property or valuable security with the marriage of the parties is essential.[2]

Definition of dowry can be understood with the other sections of the Dowry Prohibition Act such as section 3 which, mentions to giving or taking dowry and section 4 which, deals with a penalty for demanding dowry. This makes it clear that even demand of dowry on other ingredient being satisfied is punishable. In Prem Kumar v. State of Rajasthan[3],the Supreme Court says that it is not always essential that there be any agreement for dowry because section 3 prohibits the demand, acceptance or payment of a dowry, as consideration for the marriage, where dowry defined as a gift demanded or given as a precondition for a marriage. Taking or giving of
dowry is punishable by an imprisonment up to six months, a fine of up to fifteen thousand rupees or the amount of dowry, whichever is more, or imprisonment up to five year. However in accordance with section 3 of the Act, both the giver and receiver are pursued to be punished. Demanding of dowry also is punishable under section 4 of this Act.

In S. Gopal Reddy v. state Andhra pradesh[4], the Supreme Court stated that the demand, though it was made prior to the marriage has to be considered as offence under section 4 of the Dowry Prohibition Act. In this case the court stated that, mere demand of dowry is enough to bring home the offence to an accused and that any demand of property or money made from the bride or her relatives by the bridegroom or his parents or vice versa would fall in the troubles of dowry under section 4 of DV Act.

The considerable point stated by the Supreme Court is that marriage in this situation would contain a future marriage also more special where the non-fulfillment of the demand of dowry leads to the bad result of the marriage not happening at all. In Pavana Kumar v. State of Haryana[5], when persistent demands for TV and Scooter are made from the bride or her parents after marriage, it would constitute to be in connection with the marriage and it would be a case of demand of dowry in the meaning of section 304-B.

The Supreme Court in the case of Satvir Singh and Ors v. State of Punjab and Anr [6], stated that, in the cases of dowry death, the circumstances of harassment and cruelty to the victim have to been seen soon before her death. The expression ‘soon before death’ used in section 304-B of IPC is present with the idea of proximity test. No definite period has been indicated and this expression is not defined. The determination of period soon before is to be determined by the Courts depending upon facts and circumstances of the case. Normally the expression ‘soon before’ would imply that the time should not be much between the concerned harassment or cruelty and the death of deceased. On proof of necessary in section 304-B, it becomes essential on the court to raise an assumption that the accused caused the dowry death.

In the case of Yashoda and another v. State of M.P[7], the Supreme Court says that, the presumption shall be raised, such cruelty or harassment was for or in connection with, any demand of dowry or, such harassment or cruelty was soon before her death.

In another case in State of Punjab v. Iqbal Singh and Ors [8], a woman set herself and her three children on fire. She was working as a teacher. Soon after the marriage there were arguments between the husband and wife on the request of dowry, the demand for extra dowry strained the relation between them and as a result the husband began to misbehave the deceased wife. She also lodged police complaint. Inspite of the same, the situation did not improve and she was forced to take the dangerous step of putting an end to the life of herself and her three children. The Supreme Court sentenced the accused husband under section 304-B.

Woman also being subjected to cruelty or harassment by the relatives of her husband, their in-laws may drive her to suicide by continuous harassment and torture, in the case of Amar Singh v. State of Rajasthan [9], Supreme Court held that under section 304-B IPC the mother-in-law and other in-law of the deceased were taunting the bride for bringing less dowry, so they drive her to commit suicide, it would amount to causing dowry death.

B) Cruelty Relating to Dowry

Traditionally woman is subjected to the whims and caprices of man, particularly when it relates to the relationship of husband and wife it becomes worst. Woman in a family or a relationship with her husband sometimes becomes intolerable and miserable which drags the woman towards suicide. Section 498-A of IPC comes into play on such situation. Section 498-A of IPC can only be invoked by a married
woman against the husband or his relatives for cruelty. This section was added with the intention to protect women from dowry harassment, domestic violence and to end the offences of cruelty by husband or in-laws of wife and providing punishment to the husband or relative of the husband of a woman subjecting to cruelty. section 498-A, manifests with four types of cruelty: Any conduct that is likely to drive a woman to commit suicide; any conduct which is likely to cause serious injury to the life, limb or health of the woman; harassment with the aim of forcing the woman or her relatives to give some property; or harassment because the woman or her relatives are either incapable to yield to the demand for more money or do not give some share of the property. Supreme Court in M.Srinivasulu v. State of A.P [10], stated that, Consequences of cruelty which are likely to drive a woman to suicide or to cause grave injury or danger to life, limb, or health, whether mental or physical of the woman is necessary to be established in order to bring home the application of section 498-A of IPC.

Section 498-A, IPC, manifests that whoever being the husband or relative of the husband of a woman subject such woman to cruelty shall be punished with imprisonment for a term which may extend to three years and shall also be liable to fine. Clause (b) of the Explanation to that section shows that the harassment of the woman where such harassment is with a view to coercing her or any person related to her to meet any unlawful demand for property or valuable security. A complainant if wants to come under the ambit of Clause (b) of Explanation of section 498-A, she can succeed if it can be proved that there was an "unlawful demand" by the husband or any of her relations in respect of money or some valuable security [16].

Section 304-B and section 498-A are not mutually exclusive. these provisions deal with two distinct offences. It is true that ‘cruelty’ is a common essential to both the sections and that has to be proved.

In Atmaram v. State of Maharashtra [17], woman was subjected to harassment by her husband and his relatives, purposely. The Supreme Court held that, Clause (a) of section 498-A, deals with aggravated forms of cruelty which cause grave injury, and convicted her husband for cruelty. In Shobha Rani v. Madhukar Reddi [18], the court defined concept of cruelty and a new dimension has been given, cruelty while granting a divorce to the woman on the context of demand for dowry. Explanation to section 498-A provides that any wilful conduct which is of such a nature as is likely to drive a woman...
to commit suicide would constitute cruelty. Such willful conduct which is likely to cause grave injury or danger to life, limb or health (whether mental or physical of the woman) would also amount to cruelty. Harassment of the woman where such harassment is with a view to coercing her or any person related to her to meet any unlawful demand for any property or valuable security would also constitute cruelty.

In short, the persistent demands for dowry are considered equivalent a ground for the purpose of granting matrimonial relief including divorce.

In Rameshbai Dalaji Godad v. Sate of Gujrat [19], the Supreme Court held that to prove that cruelty was led under Explanation of section 498-A, it is not important to show or state that the woman was beaten up abusing her orally, denying her conjugal rights or even not speaking to her correctly would fall into the ambit of mental cruelty. The term 'cruelty' in this section has been defined in wide terms so as to include imposing physical or mental injury to the body or health of her and indulging in acts of cruelty with a view to force her or her relations to meet any illegal demand for any properties[20]. In Smt. Sujata Mukherjee v. Prashant Kumar Mukherjee[21], the Supreme Court held that a woman who is maltreated by her husband and in-laws for dowry can file a criminal complaint at all places where such an offence under section 498-A of IPC, is alleged to have been committed against her.

Cruelty also includes harassment noticing on one's incapacity, torture and further asking her to abort. In Ajit Singh v. State of Himachal Pradesh[22], evidence strongly shows accusation of accused, that due to dowry torture deceased committed suicide, then just because informant was not examined does not vitiate prosecution. Where neighbors, relatives and surrounding circumstances lead to a decision that it was accused only who used to harass, torture his wife for want of dowry and this was a regular feature in his life, then punishment against section 498-A is justified [23]. Where demand of dowry and cruel behavior of deceased by accused proved beyond reasonable doubt, which impelled deceased to commit suicide, life sentence confirmed [24]. In the case of Solaikumar v. State Rep [25], the accused had abused his wife for her inability and forced her to leave the matrimonial life for the demand of dowry. Again after about forty-five days of her pregnancy the accused took the woman to the doctor for abortion without her will, in this case the Supreme Court stated that it would definitely amount to cruelty under section 498-A and an offence of cruelty is made out. Woman may also being subjected to cruelty by the relatives of her husband, in the case of Arnesh Kumar v. State of Bihar [26] a demand of dowry was made by the father-in-law, mother-in-law and sister-in-law which Supreme Court sentenced under section 498-A. It has been further observed by the Supreme Court that section 498-A of IPC introduced with an aim and objection to protect the women from harassment at the hands of husband and his relatives. Then, husband or his family members are presumed to be guilty till they prove their innocence in the court. A punishment contains imprisonment of up to three years is provided in the present law. This section punishes the husband or his relatives who subject a married woman to cruelty.

The table below shows the statistics rate of cases reported and Rate of crime of cruelty by husband or his relatives under section 498-A of IPC during 2010-2015.

In the case of suicide by a married woman, within seven years from the date of her marriage, the Court may presume that such commit to suicide has been abetted, encouraged by her husband or his relatives. Provisions to this effect added in the Indian Evidence Act (here in after referred to as IEA), by adding section 113-A since the year 1983. The explanation to this section says that the expression cruelty shall have the same meaning as in section 498A, IPC.
Supreme Court in *Kundula Balasubra manyam v. state of A.P* [27], says that on the alarming increase in the cases connecting to dowry death.

A new section 113-B also added to IEA by the Dowry Prohibition (Amendment) Act, 1986 which raises presumption as to dowry death in certain circumstance. It provides that when the question is whether a person has committed the dowry death of a woman and it is shown that soon before her death such woman had been subjected by such person to harassment or cruelty for, or in connection with any demand for dowry, the court shall presume that such person had caused the dowry death [28]. In *Surinder Singh v. State of Haryana*[29], the Supreme Court convicted the accused under this section. In the Explanation of section 113-B, as the Supreme Court has mentioned in *Appasaheb v. State of Maharashtra*[30], it has been provided that for the objective of this section, dowry death shall have the same meaning as under section 304-B of the IPC [31].

By section 304-B IPC and section 113-B, IEA the law authorizes a presumption that the husband or his relative has caused the death of a woman if her death is not in a normal circumstances and that there is sufficient evidence to prove that she was subjected to cruelty or harassed before her death in connection with any demand for dowry [32]. Offences that result to dowry deaths are almost always perpetrated within the safe areas of a residential house. Other members of the family are either guilty related in offence, or silent but conniving witnesses to it. There would be no other eye witnesses, except for members of the family and the family circles are so strong that truth may not come out of the chains. In *Haria Lal & Ors V. State (Govt. of NCT) Delhi* [33], where the deceased committed suicide by consuming poison because she was harassed by her father-in-law and her mother-in- law. Supreme Court sentenced, under sections 304B, of IPC and 113-B, of IEA, since the death was unnatural, information lodged with police and investigation done. To meet a situation of this kind, the legislature has enacted section 304-B, IPC and section 113-B of the IEA.

Thus, the demanding of dowry itself is a cruel action and can be a ground of divorce. A husband or his relatives can be punished for behaving cruelly with the wife by asking dowry. Cruelty of a wife for dowry is a criminal offence and misbehaviour of a wife for dowry can be punished. Also on account of the Dowry Prohibition Act, a wife or her relatives can take recourse of law and if dowry is demanded or a wife is harassed on account of dowry, the persons doing so can be punished.

Though law has provided strict actions to control this danger unless the whole society believes that dowry is an evil dowry could not be erased from the society, unless there is a strong awareness in the minds of the publics, unless every mother-in-law thinks that at one time she also is a daughter-in-law, unless every mother thinks that the behavior which she gives to her daughter-in-law may also be received by her own daughter.

Marriage is a holy ceremony, harassing women because of inadequate supply of dowry is not moral. It is so difficult to recommend a set of factors accountable for the custom of dowry, because dowry has become a complex phenomenon and a social problem that it requires immediate remedial actions. Although, the Government of India has taken good initiatives to combat this issue through enacted numerous laws for the prohibition of dowry system which impose punishment for dowry, but the Government of India should come out with some more severe laws to protect the rights of women who are victims of dowry.

IV. CONCLUSION

Though law has provided strict measures to control this
danger will be continued; Unless the whole society believes that dowry is an evil, unless there is a strong awareness in the minds of the publics, unless every mother-in-law thinks that at one time she also is a daughter-in-law, unless every mother thinks that the treatment which she gives to her daughter-in-law can also be received by her own daughter, the evils of dowry will remain in society. Too, society and anyone as a member of the society can do lots to prevent offences of harassment, dowry death, etc. by considering the following steps; Start practicing dowry prohibition in the family, educate the members of family with the provisions of law that demanding and accepting or giving dowry is an offence. If in any family there is a growing conflict among the in-laws and the wife, try to interfere to sort out the differences and educate them about the evils of dowry system. Because a woman is a significant member of family and is entitled to all the rights and privileges a man enjoys.

All social scientist and law makers altogether opine that education can solve the problems to a large extent. But the most pathetic story is that the dowry has been related with the educated elite class in a main way. Educated class should think in a high-minded way to overcome these problems. Though several state governments have brought various legislations into force to check the increasing threat of dowry, even this has not helped in anyway. The greatest remedy to overcome this type of harassments is to change oneself. Apart from this the attitude of the woman should change. This alteration should come from within every individual woman concerned. The laws connected with this system should become stronger and stronger and there by the individuals, the intellectuals, the press and the elite class shall take it as a challenge to eliminate this problem to save the society from this antisocial activity.

The evil of dowry cannot be battled by a few persons. It required a wide spread change. Then best education is the best dowry. Parents are guided to educate daughters and it is time that education has more value in the service market and fields have been opened for women to become solution. In this way amount of dowry may be invested for her secured future.

References

[33] Haria Lal & Ors V. State (Govt. of NCT) Delhi, AIR 2003 SC 2865..

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Integrated Flood Risk Management using Multi Criterion Decision Analysis- A case study of Bihar

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ABSTRACT: Floods are the most recurring hazard in Kosi and Gandak river basin of North Bihar in eastern India. Despite a long history of flood control measures in the state for more than six decades, the rivers still continues to cause a huge disaster and a lot of misery in the region due to extensive flooding. The Kosi and Gandak River typically shows very high discharge variability in addition to high sediment flux from upper part of catchment. This often results to inundation followed by flooding in the low-lying tracts of the alluvial plains. This paper re-visits the flooding issue in Kosi and Gandak river basin and presents an in-depth analysis of flood management. This flood risk analysis follows multiple criteria decision analysis (MCDA) using Concept of Choosing by Advantage (CBA) for selecting component of Integrated Flood Risk Management (IFRM) by stakeholder and decision makers.

Keywords: Floods, MCDA, CBA, IFRM

1.0 INTRODUCTION: Flooding as mentioned effects on infrastructure, environment and economic activity including agriculture. A risk manager or stake holder providing flood management service is most concerned that a flood is predicted, appropriate warnings are dispersed and acted upon. whereas as a risk manager or stake holder who is responsible for construction of embankment or flood protection structure is concerned with timely completion of work, appropriate site selection, its effectiveness and many more aspects. Likewise for risk manager dealing with different component of IFRM has different prime concern. Benefit-cost analysis is still used as a convenient mechanism for comparing options, but its potential shortcomings are always there.

In this paper IFRM has been advocated for protection from flood. The key approaches which are component of IFRM are i) Flood Policy and Strategy Development ii) Vulnerability Analysis, Risk Modelling and Mapping iii) Flood Data and Information Management iv) Flood Early Warning Systems v) Flood Infrastructure Concepts vi) Ecosystem-based Approaches for Flood Management vii) Emergency Planning and Response. As far as selection of a particular component (alternative) or its prioritization for a particular risk manager or risk event is concerned where alternatives of IFRM depends on various factors. MCDA can be used to select a particular alternative by analysis of various factor on which it depends. Study of flood is very complex and number of techniques has been suggested by various research scholars for MCDA. In order to implement IFRM, It is desired to select its alternative depending on various factors. For that one should use MCDA. In this study we have adopted CBA method.

There is plethora of published literature on MCDA such as (Bana E Costa 1990; Zimmermann & Gutsche 1991; Vincke 1992; Munda 1995; Belton & Stewart 2002). Most of these textbooks deals with mathematical aspect of MCDA like the decision rules, various approaches and methods like MAUT, Outranking and AHP etc. In his book- Decisions with Multiple Objectives Preferences and Value Trade-Offs, Keeney & Raiffa (1993) focus on the MAUT approach. On other hand Drechsler (1999; see also Klauer et al. 2006) focus on extensions of the Preference Ranking Organization Method for Enrichment Evaluations approach.

From the literature it appears to be assumed that all MCDA methods are equal or that the differences between them does not matter, and it is left to the user to select any one. But actually methods matter. In CBA valuing the importance of advantages between various alternatives makes this method viable. Methods that rank factors or values, such as value-based methods, require a high level abstraction, inducing unanchored conflicting questions. And hence CBA methods are superior to other methods for making sustainability decisions.

2.0 STUDY AREA

As a case study for Implementation of IFRM we have selected Kosi and Gandak river basin (Figure 1) which extend from mountainous region of China, Nepal up to plains of plains of northern Bihar, India.

www.ijsrp.org
River floods are one of the most common natural disasters in South Asian Countries. India, Bangladesh and China top the list of people across the world worst affected by river flooding. Huge drainage area of rivers as been depicted by drain lines on study area (Figure 1) where about 5, 3.5 and 3.3 million people are exposed every year, respectively. The potential national economic consequence of river floods is highest in India which has by far the most GDP exposed at ₹13,000 million. India as a country faces more potential change in exposed GDP than any other country and could increase more than 10-fold to 2030. The major flood prone areas of India cover almost 13.63% area of the country. The chronic flood prone basins are Ganga and Brahmaputra covering northern and north-eastern parts of the country. The five most flood prone states are Uttar Pradesh (U.P.), Bihar, West Bengal (WB), Assam and Odisha (Gupta, Javed, & Datt, 2003).

3.0 CONCEPT OF CBA AND APPLICATION EXAMPLE

CBA is a sound system to make decisions using well-defined vocabulary to ensure clarity and transparency in the decision-making process (Parrish and Tommelein, 2009). In order to explain how CBA tabular method can be used for MCDA, a very simple example from AEC industry is being discussed. For simplicity we are comparing only two alternatives: (1) standard wall construction and (2) double stud wall construction.

In this example we considered the following factors and criteria: (1) Thermal Control and the criterion for selection is ‘higher Thermal Control is the better’. (2) Durability and the criterion for selection is ‘the building must last 50 years.’ (3) Buildability refers to how easy it is to build the wall assembly. The criterion for selection is ‘the easier to build, the better.’ (4) Material use and the criterion for selection is ‘the less material used the better.’

Step1: Alternatives are identified which likely yield important advantages over other alternatives.

- Standard wall construction and Double stud wall construction

Step2: Factors are defined with the purpose of differentiating between alternatives. In CBA that factor is identified which will reveal significant differences among alternatives.

- Thermal Control, Durability, Buildability and Material use

Step3: Criteria for Selection is decided as following.

- Higher Thermal Control (R-value) is the better, Building must last 50 years, Easier to build is the better and Less material used is the better

Step4: Summaries the attribute of each alternative by making research in a Table 1.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Alternative 1 Standard wall construction</th>
<th>Alternative 2 Double stud wall construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Control</td>
<td>R-10</td>
<td>R-15</td>
</tr>
<tr>
<td>Durability</td>
<td>Depend on exterior barrier</td>
<td>Depend on exterior barrier</td>
</tr>
<tr>
<td>Buildability</td>
<td>Easy to Construct</td>
<td>Requires skill</td>
</tr>
<tr>
<td>Material use</td>
<td>Framing lumber could be minimized</td>
<td>Wall framing material is increased significantly</td>
</tr>
</tbody>
</table>

Step5: Identify lowest preferred attribute of every factor and decide on the advantage of each alternative’s attribute relative to least preferred factor (Table 2).
Step 6: Decide on the importance of advantage by selecting paramount advantage, which is most among all. Paramount advantage is used as anchoring point to weight other advantage by making comparison and then the importance of advantage is summed up for each alternative (Table 3).

<table>
<thead>
<tr>
<th>Factor</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thermal Control</td>
<td>R-10 Standard wall construction</td>
<td>R-15 Double stud wall construction</td>
</tr>
<tr>
<td>Higher R-value is the better</td>
<td>Adv.: Imp.</td>
<td>Adv.: Higher R-Value by 5 Imp.: 70</td>
</tr>
<tr>
<td>Durability</td>
<td>Depend on exterior barrier</td>
<td>Depend on exterior barrier</td>
</tr>
<tr>
<td>Building must last 50 years</td>
<td>Adv.: Imp.</td>
<td>Adv.: Imp.</td>
</tr>
<tr>
<td>Buildability</td>
<td>Easy to Construct</td>
<td>Requires skill</td>
</tr>
<tr>
<td>Easier to build is the better</td>
<td>Adv.: Easy to build Imp.</td>
<td>Adv.: Imp.</td>
</tr>
<tr>
<td>Material use</td>
<td>Framing lumber could be minimized</td>
<td>Wall framing material is increased significantly</td>
</tr>
<tr>
<td>Less material used is the better</td>
<td>Adv.: Lesser material Imp.</td>
<td>Adv.: Imp.</td>
</tr>
</tbody>
</table>

Step 7: Now the importance of advantage is compared and best alternative is selected which is in turn compared with cost separately. In this case Alternative 1 Standard wall construction has 80 importance of advantage, which is more than Alternative 2 Double stud wall construction. Hence Alternative 1 is selected by CBA.

4.0 DESCRIPTION OF CASE STUDY

Bihar is India’s most flood-prone State, with 76% of the population, in the north Bihar living under the recurring threat of flood devastation from River Kosi, Gandak and some other small rivers. About 6.880 million hectares of land out of about 9.416 million hectare comprising 73.06% is flood affected in state of Bihar. Salient features of study area have been mentioned in table 4. Community needs related to floods in Bihar are diverse as physical and socio-cultural characteristics are bound to vary from basin to basin. Even within each basin the needs and problems of local communities differ between the upper, middle and downstream parts.

Table 4: Silent features of Kosi and Gandak River basin

<table>
<thead>
<tr>
<th>Factor</th>
<th>Gandak</th>
<th>Kosi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>630 km India–300 km (approx.)</td>
<td>720 km India–260km, Nepal-50km</td>
</tr>
<tr>
<td>Catchment Area</td>
<td>46,300(in km²) China – 5687, Nepal – 30882</td>
<td>74,500(in km²) China – 35567, Nepal – 27863</td>
</tr>
<tr>
<td></td>
<td>Bihar – 7288, UP – 1874</td>
<td>Bihar – 1107</td>
</tr>
<tr>
<td></td>
<td>China – 5687, Nepal – 30882</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bihar – 7288, UP – 1874</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1529(Av. Annual)</td>
<td>2,236(Av. Annual)</td>
</tr>
<tr>
<td>Discharge (m³/s)</td>
<td>12500(Bankful discharge)</td>
<td>6615(Bankful discharge)</td>
</tr>
<tr>
<td></td>
<td>18116(Observe max discharge) on 31 July 2003</td>
<td>12043(Observe max discharge) on 5 Oct 1967</td>
</tr>
<tr>
<td></td>
<td>27294(Probable max flood)</td>
<td>23153(Probable max flood)</td>
</tr>
</tbody>
</table>

In Bihar most of the floodplain agriculture, which is a key livelihood for millions, consists of rain fed (Kharif) cropsare vulnerable to flood in case of heavy monsoon rain. Flood waters often stay for more than a week in agricultural fields affecting crop yield. Long duration flood also affects fodder which on its turn is impacting livestock. In many places heavy floods also cause sand deposition on fields making it unsuitable for agriculture. Post-flood environmental and health issues were found to be also a serious problem in the basins. Poor sanitation and environmental conditions are causing a high incidence of water borne and vector borne diseases during and after the peak floods have receded. All the river basins lack adequate flood shelter facilities and godowns for storing food and seeds for communities. For shelter the communities resort to schools, community halls, terraces of...
pucca houses, and even roads and embankments.

IFRM is discussed for sustainable solution for this problem which aims at sustainable development, maximizing net benefits from floodplains, minimizing loss of life in particular thorough preparedness planning for extreme events and environmental preservation.

5.0 COMPONENTS INVOLVED IN IFRM

5.1 Flood Policy and Strategy Development
Suggestion for Institutional Development for better policy and strategy against flood in Bihar like Institutional coordination by developing Standard Operation Procedures (SOP), Organizational strengthening and Capacity building / training in IFRM

5.2 Vulnerability Analysis, Risk Modelling and Mapping
Flood Risk Modelling and Mapping which can be undertaken in Bihar such as River Modelling, Breach Assessment, Overtopping Analysis, and Surface Water Runoff Calculations.

5.3 Flood Data and Information Management
Supporting the implementation and maintenance of hydrometric networks and hydrodynamic models, including flood scenario development and forecasting. Assessing the interaction of land use change and hydrology in combination with climatic as well as regional and national studies. Developing human and institutional capacities to improve inter-sectorial communication and supporting the implementation of shared information platforms.

5.4 Flood Early Warning Systems
The gauge-to-gauge relationship has a limitation of waiting till the flood is observed at the base station upstream of the forecasting station. Therefore in the process, the possible lead time from the catchment lag up to the base station is lost. Such lead time can be easily added by introducing a hydrological model that can transform the observed rainfall into a simulated hydrograph at the base station. Thus there is a need for improving the lead time, forecasting river flow at any site along the river, and mapping like inundation from the forecasted flood at community level for effective flood response.

5.5 Flood Infrastructure Concepts
Suggestion for Flood mitigation Infrastructure development for Bihar which includes improvement of lead time for flood early warning and warning message dissemination mechanism. Review of the reservoir operation rules for enhanced flood cushioning (15% of live storage is recommended). Upgradation of embankments up to required safety level. Improvement of rural drainage to reduce water logging problem and improvement of flood cushioning in the basin. Improvement of urban drainage as an integrated approach while town planning.

5.6 Ecosystem-based Approaches for Flood Management

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Through their natural processes such as infiltration, evapotranspiration and the storage of surface and ground water in lakes and aquifers, ecosystems provide valuable flood management services to both urban and rural environments. Vegetated buffer zones, for example, can reduce runoff whilst wetlands can act as temporary storage reservoirs.

5.7 Emergency Planning and Response

As part of comprehensive disaster risk management and in order to enhance capacities of national partner institutions, local communities and the private sector for post flood situations, following services should be implemented to strengthen capacities for emergency planning and response. Like, Development of communication materials and training in order to build capacity for the public sensitization and education on behavior and measures in emergency cases. Contingency planning, including the development and testing of appropriate standard operating and evacuation procedures. Establishment of communication channels for a quick and efficient flow of information in case of emergency between institutions. Clarification and functional distribution of tasks and competences amongst stakeholders at all levels. Integration of disaster risk management into urban development plans. And also, post disaster needs assessments.

6.0 APPLICATION OF CBA

Table 5. Calculation Sheet of CBA table

<table>
<thead>
<tr>
<th>Factors</th>
<th>Alternative 1</th>
<th>Alternative 2</th>
<th>Alternative 3</th>
<th>Alternative 4</th>
<th>Alternative 5</th>
<th>Alternative 6</th>
<th>Alternative 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rank</td>
<td>Weightage to Factor</td>
<td>Rank</td>
<td>Weightage to Factor</td>
<td>Rank</td>
<td>Weightage to Factor</td>
<td>Rank</td>
</tr>
<tr>
<td>Flood Policy and Strategy Development</td>
<td>Rank 7</td>
<td>Investment 8.00</td>
<td>Rank 6</td>
<td>Time of implementation 7.20</td>
<td>Rank 5</td>
<td>Reliability 5.00</td>
<td>Rank 4</td>
</tr>
<tr>
<td>Vulnerability Analysis, Risk Modelling and Mapping</td>
<td>Rank 4</td>
<td>Vulnerability Analysis 6.67</td>
<td>Rank 3</td>
<td>Flood Data and information Management 4.00</td>
<td>Rank 2</td>
<td>Flood Early Warning Systems 1.33</td>
<td>Rank 1</td>
</tr>
<tr>
<td></td>
<td>Rank 2</td>
<td>Importance 4.00</td>
<td>Rank 3</td>
<td>Importance 3.60</td>
<td>Rank 2</td>
<td>Importance 1.80</td>
<td>Rank 4</td>
</tr>
<tr>
<td></td>
<td>Rank 1</td>
<td>Advantage 1.00</td>
<td>Rank 0</td>
<td>Advantage 0.00</td>
<td>Rank 0</td>
<td>Advantage 0.00</td>
<td>Rank 0</td>
</tr>
</tbody>
</table>

In IFRM Seven numbers components are compared for the main advantages of each alternative in step by step process. In step 1, identify the alternatives likely to yield advantage over other alternatives which in case of IFRM are seven components as mentioned above. In step 2, define factors with the purpose of differentiating between alternatives which has been mentioned in first column of the table 5. In CBA it’s important to identify which factor will give significant differences between all alternatives. In step 3, Criteria for judging is decided like higher is better or lesser is better etc. In step 4, all attributes or characteristics of each alternative is summarized. Step5, Least preferred attribute of each factor is identified and the advantage of each alternative’s
attribute relative to least preferred one is decided. Importance of advantage is decided by selecting paramount advantage, which is most among all. Paramount advantage is used as anchoring point to weight other advantage by making comparison and then the importance of advantage is summed up for each alternative. Step 7, now the importance of advantage is compared and best alternative is selected which is in turn compared with cost separately. For different components of IFRM sustainable alternative is selected by CBA as tabulated above.

7.0 RESULT

In Table 5, the importance of advantage is tabulated for each alternatives. Importance of all factors for every alternative is summed up. For different components of IFRM sustainable alternative is selected by CBA for maximum importance. In this case study of IFRM in Bihar the component which may be chosen by advantage is “Vulnerability Analysis, Risk Modelling and Mapping” i.e. alternative having overall maximum importance of 38.23.CBA methods are superior to value-based methods of MCDA when selecting a sustainable component of IFRM. CBA helps stakeholders to make decisions based on relevant facts minimizing conflict. In contrast, other methods, which ask stakeholders to weigh factors, may not focus to the same extent on the importance of the advantages between attributes of alternatives, and therefore stakeholders may have difficulties in resolving conflicting interests and collaborating. Methods that weight factors are not taking decisions based on the relevant facts, therefore they should be more likely to produce wrong decisions. Consequently causing worse environmental, social and economic impacts of the Flood irrespective of the management adopted.

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Abstract- Educational development policies in Pakistan, especially in military regime, when Pakistan faces non-electoral government were focused on both national and international educationists and experts. Lots of reports analyzed the performance of Musharraf government in education department. President of Pakistan Pervez Musharraf introduced lots of reforms which ultimately assist the modernization of education department in the country. Historically the educational policies of Pakistan remained under the strong influence of religious ideologies and education, global challenge, social agenda, regional trends. After the global challenging incident of 9/11, the attacks on world trade center, affected all interests and needs of globalization. This article is compiled to highlight the policies and reforms in the era of president ship of Musharraf (1999-2008).

Index Terms- Education, Development, Planning, Program, Policy

I. BACKGROUND

Musharraf era was not affectionate era in that time due to military rule. But that time national progress was very important problem due to contradict administration of military rule among the people of country. To resolve this problem, a major role of people of country whom were opposed that era but this government took steps to meet the educational needs. In this era education program enhanced widely, particularly 2002-2010, in last few years, the enlighten moderation policy was focused on human development which considered crucial part of national development.

The poverty (which considered basic cause to out of school children) reduction policy acknowledged that social advancement like developed countries is compulsory, and the government make a priority for improvement in educational sectors and developed the facilities in making access for general population of Pakistan. Primary education was especially focused under this policy.

As per as regarding the enrollment in educational institutions is seen too much poor. Medium Term Frame Work (MTDF: 2005-2010), National Plan of Action (NPA 2001-2015) Education for All (EFA) Educational Sector Reforms(ESR: 2002-2006) and moreover National Education Policy(NEO 1998-2010) were framed and focused to meet these discrepancies and achieving the goals of structurally social development.

Under the policy of ESR, religious institutions and national educational system was reformed. In this regard, more than 11 madaris (religious institutions) and modern schooling system came closer in the content and curriculum of education. To renew the curriculum of Islamic extremist institution was tough element. Musharraf covenanted all that seminars which were arranged under the Islamic perspective on the basis of international scrutiny by monitoring their funding. Those institutions, that promote Jihad and other such as activities were modified in their curriculum. At this time US financial aid and other institutions were became the controversial matter.

Pakistan received specified more than 100 million dollars for educational reforms in July 2002, for the purpose of five year educational development program. After the incident of 9/11, Pakistan cooperation with US government against suspected Al-Qaeda operation through intelligence briefings. Against it, the US government support in the field of education in Pakistan. An essential part of US cooperation against the weak system of education in Pakistan. Under developing economy of Pakistan and rising sectional discord was the intensifying the potential of extremism is the rising problems of Pakistan which needs to control and government took step against these factual matters with the help of US cooperation.

Under the society act of 1860, all the religious institutions were advised to register; this constitution was government and private organizational law. So, under this law, there were not every Madrassa compiled with the registration obligations. US support the Pakistan with 255 million dollars for five years plan for education reforms, and madrasas were expected to 8000 institutions. Since 2001, an ambiguous goal was set to stop the extremism in religious sections in madrasas. After the 9/11 incident, the government of Pakistan’s first attempt was took with the promulgation of Pakistan madrassa Education Board Ordinance (PMEDO) 2001.

Although, it remained until early 2002, this ordinance was adopted finally with the consult of “Ministry of Religious Affairs” and budget was granted with “GOP 2001:102” approval. The constitution was constituted to integrate the subjects like, English, Pak-Study, mathematics and Computer in madaris and established new model schools in Karachi, Sukkur and Islamabad in 2003. These three model Madrassas were established for girls especially and these institutions running through the Zakat fund. These madaris were demonstrated with fundamental facilities at academic level and funds were made assure for this purpose. These institutions were required to teach the state sponsor subjects and curriculum. These institutions got all the degrees.

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and certificates issued by governments after the completion of registrations.

1.1. Musharraf Educational Reforms:
Education is the best way to defend the nation with inexpensive stream of process as compares to other ways. But the ongoing system of education could not defend by its own due to its unreliable condition. In 62 years of Pakistan history, there were 23 policies and action plans were introduced in this sector but no one came as a savior. Pervez Musharraf invests a great budget on this sector in his era, to make the visible change in the nation.

In those days, the economic position of Pakistan was not good and that’s why Pakistan education sector was affected very badly. Pakistan constitution announced that the education at secondary level is very compulsory to remove the illiteracy of badly. Pakistan constitution announced that the education at primary level is 10:4 respectively. This discrimination increases the growth of private sectors in last few years. Lack of attentions towards technical education in Pakistan and Ch. Pervez Elahi also works very hard on educational standard in his province.

1.2. Educational Problems in Pakistan:
1. This sector of Pakistan is suffered from inequality due to medium of instructions, Urdu medium and English medium. These lines sorted the peoples in public and private sectors.
2. A major cause of disparity is due to regional areas of institutions. For example, the largest province by area is Baluchistan and the schools could not groom as well as Punjab, although the Punjab province is largest by population. Federally Administered Tribal Area (FATA) is also suffered from lowest literacy rates, the rates were concludes 29.5 percent and 3 percent in males and females respectively.
3. Gender disparity is caused the discrimination in public and private sector. The ratio between boys and girls at primary level is 10:4 respectively. This discrimination increases the growth of private sectors in last few years. This does not effects of quality of education but create a gap between those who have and who have not.
4. Lack of attentions towards technical education in existing educational policies creates a large flaw, because technical peoples are compulsory the progress of a country. Pervez Musharraf makes tries his best to fill up this flaw through promoting the technical education in Pakistan and Ch. Pervez Elahi also works very hard on educational standard in his province.
5. Budget allocation was not focused this sector at compulsory level. Allocation of funds for this sector was only 1.5% to 2.0% of Grass Development Production (GDP). But our basic need in this sector was 7% of GDP. In this era, 3 to 4% of the budget was reserved for this purpose which was reduced in PPP government later. We were unable to contest with the developed countries like Malaysia because they reserved 35% of their GDP only for education sector.
6. Absent of training centers for teachers effects of bitterly on quality of education. Untrained teacher couldn’t work well than the professional trained teachers. So that, due to quality of education, no one can prefer the education sector as his professional field.
7. Poverty is a main factor which could not allow the parents to send their child for education in public or private institutions. So they prefer the free religious institutions like madrassas. So that the uneducated peoples cannot got the job for survive at homes.
8. Regarding these problems, minister of education pronounced for 10 years new Education policy although the policy for 1998 to 2010 was not expired till that time. New policy makes numerous reforms in this sector and announced new plans for education. Inthis policy all public educational institutions will be groomed up to the level of private educational institutions. A notice issued for private sector to conduct the 5th and 8th class under the board exams. But problems were same, because no plan of action was discussed and private students were mainly disturbed from this new policy.
9. 

1.3. Reforms and Achievements of Musharraf:
Musharraf’s reforms and achievements in educational sector are:
1. Nine engineering universities were established at the international level. The cost of reconstructing of the buildings of these Universities was over Rs 96.5 billion.
2. In 1999-2000, there were 31 Public Universities, which were increased at 49 Public Universities in 2005-2006. Air University was established in 2002 and also the Institute of Space Technology (IST) was developed in 2000. In 2005, University of Science and Technology was established in Bannu, Virtual University Lahore was established in 2002, University of Hazara was established in 2002 and University of Gujrat was established in 2004.
3. In 2002-2005, literacy rate was increased 45 percent to 53 percent respectively in Pakistan. English language was renowned as a compulsory subject in curricula and moreover 4 percent of GDP were invested on this sector.
4. Total, 99,319 institutions were increased in this era.
5. In 1999, there were 300 students of Pakistan who got the Philosophy of Doctorate (PhD) Degrees and in the other hand there were five thousands students of Pakistan who got the scholarships for foreign universities in Pervez Musharraf era.

1.4. Higher Education Commission of Pakistan:
Higher Education Commission (HEC) was an institution, which is supervised higher education at all level. This institution constitutionally with the status of independent and autonomous is established. It was primarily funding by oversees Pakistani to regulating, and recognizing the higher education efforts in Pakistan.

The development system of higher education level in Pakistan with the purpose of upgrading the colleges and
universities for the getting of higher education and research programs were launched in this era. Since the last few years, the HEC plays a vital role in developing the knowledge based economy in country with doctoral scholarships for education for foreign countries every year.

1.5. Musharraf Era: 2000s to End:

In the last some era’s, the education policies and competition elements remain disturbed by political forces in Pakistan according to the capability of UGC. Financial support and policies couldn’t prove effective according to the needs of higher education system in Pakistan. Musharraf took initiative for UGC into HEC in 2002 efficiently.

Musharraf invites the good consultants such as prominent scientist Dr. Atta-ur-Rehman. On September 11, 2002 with the help of presidential ordinance, Dr. Atta u Rehman became the first chairman of HEC.

In this era, the HEC makes ambitious program to uplift the higher education system, improving the quality of education according to needs of modern reforms for Pakistan. After 2009 to 2013 the President of Pakistan appointed Dr Javaid Laghari as the new chairman of Higher Education Commission. He continued work to improve the system of higher education in Pakistan.

1.6. Executive Summary and Recommendations:

Aimed at modernizing the education system in Pakistan, President Musharrarf’s government offered its Education Sector Reforms (ESR) plan in January 2002. There were lot of objectives behind this plan, but most important aim was to rising a huge international inspection and pressure to control the religious activism by presenting more secular system in the wake of the attacks 11th September 2001.

Ourschools are failure to provide such education that is relevant to their everyday lives, child labour, misbehave, crime, teacher’s attitude and methodology and dropout rates.

It was hoped that after the implementation of Reforms related to Devolution of Power Plan this sector will show the better performance, but it has generated confusion and overlap of work, so the education officers at district level are not performing their duties at satisfactory manner due to the overwork.

The state is interested in regulating the syllabus of public schools and trying to provide instructions; firm, accurate, solid and research based. In Pakistan where there are a numerous people having different religion, language, culture, dress and ethnic and moral values, the curriculum and education system should be the source of unity, whereas in our country the education contents of government school, private schools and madrassas have a great contrast, which is encouraging the ethnic, sectarian appearances and promoting the culture of intolerance.

In Pakistan public school system is declining and state is responsible for the falling standards of curriculum. Not entirely but mostly our education system is producing the generation having linguistic, ethnic, religious, sectarian pride, and this pride leads to violent protests and intolerant.

1.7. Madaris, Education and Government Policy in Pakistan:

Madrassa means to center of religious education in the extent of modern and fortunate segment of pattern, but peoples considered it as a traditional and less fortune material’s institutions.

There were three modal institutions were established due to modern reforms of education sector in 2001. These institutions were in Karachi, Sukhkur and Islamabad. These institutions were teach the secular subjects too like English, economics, math, political science, computer science, political science, Pakistan study and law. Moreover, proper check and balanced was launched on madrassa education.

Under the discussed reign, madrassas were enforced to implement the modernization programs. Education Sector Reform Assistance (ESRA) ensured one billion dollars, including the five years education reforms plans, on the condition of secular subjects with religious curriculum. For the assimilation of hundreds of public schools by United States Agency for International Development (USAID) and religious & secular seminaries, bilateralagreements were granted a one hundred millions dollar.

To resolve the problem of extremism in Madaris and movement which defend the terrorism activities, Musharraf gave the deadline to all Madaris to register their institutions with the Wafaq-ul-Madaris in 25th July. Wafaq-ul-Madaris is an institution, which deals with religious matter among the country. The government of Pakistan introduced the secular subjects for these religious institutions too, to stop the mainstream of extremism. This ordinance was called the, Pakistan Madrassahs Education Board Ordinance (PMEO)2001, which was established and affiliated with Model Deeni Madaris. On 18, August 2001, it was circulated and these institutions were registered under the Societies Act 1860-1994. A large number of madaris were registered under this act.

1.8. Madrasa, Pakistan, Reform Education, 9/11, Islam:

Madrassas were considered the base of knowledge in past but unfortunately, the incident of 9/11; the madrassas were seen in the glance of extremist productions and crept out the ages of unconsciousness.

No one deny the fact that this religious institution was the phrase of un-due inquisitiveness and resourcefulness of international spectators. The unexpected tragedy of US by Al-Qaeda and Taliban changed the image of perception of these madaris. The image goes to world of madrassas, and extremist group of madaris production instead of simple schooling of education.

In this reign, The Musharraf Government introduced enlightens moderation against the Islamization of Zia-ul-Haq, to try to omit the expression of Islamic extremism with the help of followers and its philosophy.

It is observed that there were lot of problems which had been faced such as, Slight allocations of budget, less literacy rate, little enrolment ratio, very high drop-out rate, and inequalities of gender and regional account major obstacles that affects directly educational development in Pakistan.
During his regime, Pervez Musharraf change his policy towards the Madrassahs and modification his attention from Islamization to Modernisation of the institutions. During the June 2000, Pakistani state was keen interested in registering the all madrassahs, but about only one tenth (4350) madrassahs were agreed to register and the remaining were not satisfied. The madrasah establishment ignored the status of register because there was no punishment if they did not register and no advantage if they register.xiv

Government of Pakistan introduced, Pakistan Madrassa Education Board (PMEB) to create the model and legalize madrassahs system in August 2001, Pakistan Madrassa Education Board Ordinance 2001 was launched for this purposexv. The PMEB has the right to set up new model madrassas and regulate the conditions of remaining institutions on the sanctions of its Academic Council. The remaining madrassahs could affiliate with private sector at the recommendations of the PMEB. This step was taken to boost the madrassas to deliver the religious and secular education at same timexvi.

1.9. New Directions:

Sustainable Development Policy Institute (SDPI) called a prominent educationist to revise and report on problem related to textbooks and curriculum in June 2002; with an outlook to read out the books that are sharing to generating the couture of religious intolerance, violence and sectarianism. They were commonly researcher with wide-ranging fields of specialization, people with experience of working in educational management and planning, related to schools of sciences and arts, college and universities and in the private region. On 7 to 8 June the first workshop was arranged in SDPI. It was gritty that education has a large number of problems; so the participant should focused on an origins of these issues and search the solution of the problems basically linked with key subjects taught in Classes I to XIII: Urdu, English, Civics and Pakistan Social Studiesxvii.

1. Removal of realities and growth of incorrect factors,
2. Gender catalogues
3. Criticize on war
4. Educational problems
5. Ethnic, national and religious biased
6. Harmony and patience

History subject was biased and falseness became the reality in syllabi history etc.

This trend has created a specific view worldwide that this nation has removed the facts and added the biased details and figures, which have generated misunderstanding, problems at national and international levelxviii.

1.10. Education Spread:

1. Degree Awarding Institutions (DAI), 81 new universities and 14,117 colleges and schools were opened.
2. 1,267,519 stipends were launched for the needy students.
3. Free of cost books were provided to 47,546,520 students.

4. Missing facilities were provided in 127,623 government schools.

II. Conclusion

The Government of Musharraf launched a lot of reforms in educational sector, this government focused on vital steps, which were required that time in the respect of global condition. The Education Sector Reform Action Plan (ESAP), The Commission on Human Rights, 2006, and government helped and supported the National Commission for Human Development (NCHD) for increasing the literacy rate. Policy formulations, particularly the Education Sector Reforms (ESR) for improvement madrassas according the suggested objectives of the ESR, and to bring closer to general education and madrassas education with the help of reviewing the curriculum and introducing the secular subjects, were specially focused.

Sum of Rs.225 million has been distributed in the Public Sector Development Program (PSDP) for Madrassa Reform Project 2002-2003. It was aimed to educate 1.5 million male and female students and enable them to continue their studies up to colleges and universities, and to link and consolidation lines of communication between the state and madrassas. Some writers and researchers observe Pakistan’s religious institutions as a Jihad factory. This image was not good in all over the world especially after the incident of 9/11. So reforms in education and religious institutions in Pakistan’s, was very compulsory, although, it’s a challenging matter in global world. But refurbish the image of Pakistan; these steps having great role in reforming education.

Introducing the formal subjects like Mathematics, General science, English, Social studies at primary and secondary level was the major object of the reform. Computer science, Pakistan studies, English and Economic would be taught at intermediate level.

To counter the challenge from the private schools, and madrasas and religious schools of Islamic parties and foundations that fill the gaps of a dilapidated publiceducation sector but contribute to religious extremism and sectarian violence, the state will have to do far more than just increase the numbers of schools and teachers. Curriculum reform is essential and overdue. Provincial governments must ensure that textbooks and teachers no longer convey an intolerant religious discourse and a distorted narrative, based on hatred of imagined enemies, local and foreign.

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The Legal Practice of Privatisation on State Owned Enterprises in Indonesia

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Abstract- The influence of globalization in many fields (social, political, cultural, legal, economic and others) needs to be understood that the national economic development should be oriented on the constitutional commitment as defined in the Article 33 of the 1945 Constitution of the Republic of Indonesia embracing the principles of economic democracy- Pancasila. Of the many economic activities that need to be improved their productivity and their efficiency is a State-Owned Enterprises (SOEs). To optimize the role of SOEs and to maintain its presence in the competitive world economy, the SOEs need to improve their corporate cultures and professionalism based on the principles of good corporate governance (GCG) as stated in the Indonesian Government Regulation No. 33/2005 which has been amended by the Regulation No. 2009. For that reason, this study based on desk research, aims at discussing the practice of privatisation of SOEs in Indonesia. The study suggests that to implement privatization for the SOES, the government should conduct a judicial fencing associated with the implementation of the privatization, meaning that the law as an institution of social institutions must be there to play the function and its role in regulating economic activity. Also, it is argued that the privatization carried out today has no clear and strategic direction. The law No. 19/2003 on SOEs is still inadequate in providing policy guidance towards privatization. The policy and strategy of privatization currently is still not fit for the state purpose, constitution, and economic development concept. The present privatization policies and strategies tend to be more oriented to the sale of shares owned, with a maximum target price. The privatization of SOEs is still very practical oriented and pragmatic, which is more precise to mention the divestiture rather than privatisation. Thus, much remain to be done in improving the practice of privatisation towards SOEs in accordance to the 1945 Constitution.

Index Terms- Laws, Privatization, State owned enterprises, the 1945 Constitution, globalization, the government.

I. INTRODUCTION

It is widely known that the State Owned Enterprises (SOE) was established by the Government of Indonesia is for two main objectives. The first is to improve the social well-being of the people by creating employment opportunity and improving the local economy. The second is to increase economic welfare by managing and controlling strategic business sectors including electricity power companies, oil and other natural resources that were mandated in the Article 33 of the 1945 National Constitution. To achieve these objectives, a great concern on micro, small and medium scales enterprises indeed cannot be underestimated. This is simply because these economic activities play important role in the economy. In fact, these activities became the economic safety valve when there was multidimensional crisis in the fiscal year 1997/1998.

However, to achieve the above objectives, it is indeed not so easy. The reason is partly because by privatising the SOEs there will be many social dimensions that have to be limited. This is because the formation of SOEs under privatisation is usually aimed at maximising profits rather that welfare maximisation. For this reason, this brief paper aims at discussing how can the practice of SOEs’ privatisation be harmonised in accordance to the 1945 Constitution law. The data and information throughout the study were collected from library and other sources available such as in the internet media and the government regulations. This paper is organised into four sections. Section 2 highlights the forms of business organization and other relevant materials advanced in the literature. Section 3 discussed experts’ views as well as regulations to support the important of harmonisation of privatisation in accordance to the 1945 Constitution law. Finally, concluding notes are given in section 4.

II. LITERATURE REVIEW

The forms of business entity or business organization in Indonesia are many. However, many of the business forms were originated from the Dutch era. There are at least four types of business organization in Indonesia. These are Limited Company or Perusahaan Terbatas (PT), Firm, CV, cooperatives, and Maatschap. These business organizations initially were in the form of association in a broad sense which do not have their own personality and have the following elements, namely, common interests, togetherness, common goals and cooperation.

In terms of the company’s ownership, there are two types of the company. The first is the companies that were owned by the state or so called the State-Owned Enterprises (SOEs) including the Regional SOEs. The second is the private owned company whose capital is owned by the private sector, typically in the form of PT.

The regulation that regulated the SOEs was in the Law Number 19 Prp Year 1960 jo Law of the Republic of Indonesia Number 9 Tahun1969 On the Stipulation of Government Regulation in Lieu of Law No. 1 of 1969. In this regulation it was stated in Article 1, that: "Except under the legislation specified, then the efforts of the State in the form of the Company, distinguished in: Bureau Company (PERJAN), Public Corporation (Perum), and Limited Liability Company (Persero).
However, under the Law Number 9 of 1969, it is grouped that the State enterprise, are: (1). All companies that were founded and governed by the provisions of *Indonesische Bedrijven Wet* (IBW) Stbl. 1927: 419 as amended several times and supplemented, all companies in the form of public company, and public corporation. See the Law No. 19 Prp of 1960, and the Government Regulation No. 13 of 1998. Therefore, the form of SOEs has been regulated in the law no. 9/1969.

I. RESULTS AND DISCUSSION

The important of SOEs in Indonesia has been outlined in the Article 33 of the 1945 Constitution of the Republic of Indonesia, in which it is stated that Year 1945, states that:

(1) the economy is structured as a joint venture based on the principle of family;

(2) The resource production that is important for the State and which largely needed by the population is owned by the by the State;

(3) Earth, water and natural resources contained in it are controlled by the state and utilized for the benefit of the people;

(4) the national economy shall be organized based on economic democracy with the principles of togetherness, efficiency with justice, sustainability and environmental insight, independence, and balancing progress and national economic unity. This statement is the fourth amendment of the 1945 Constitution which was passed on August 10, 2002.

The above article 33 of the 1945 Constitution was approved as a very strategic and ideologist articles. The present of this article can be considered as the main philosophy that makes the 1945 constitution as the economic constitution, especially the paragraph 2 that states "controlled by the State". Also, the paragraph (3) that states that "controlled by the state and utilized for the benefit of the people"

The above two paragraphs are of course important for the State and they contain provisions on the tenure rights of the State. In the Article 33 of the 1945 Constitution paragraph (1) & (2), it is mentioned that the people gave the mandate and authority to the State and that the state governs the largely resources needed by the people. This suggest that the State should meet its obligations to the people as stated in the Preamble to the Constitution NRI 1945, as follows:

"... to protect the entire Indonesian nation and the entire homeland of Indonesia and to promote the general welfare ..." and "... the realization of a social justice for all Indonesian people ..."

Furthermore, the Article 33 paragraph (2) of the 1945 Constitution that gives the sense or meaning of "controlled by the State " can indicate the following meaning. The first is that the Constitution authorizes the State to master the production branches which are important for the State and dominate the life of many people. The second is that the state is the authority that needs to utilise the largely needed resources, while the private companies at the same time are prohibited to commercialize the production branch. The third the economic resources which has been managed by individuals or private companies while it is known that those resources are important for the country and the large of population, the State may take over those companies in according to the law.

In conjunction with the word "control" as a philosophical meaning, BPUPKI chaired by Mohammad Hatta formulate a definition of "controlled by the State" as follows: a. Government should become a watchdog and regulator that must be based on the safety of the people; b. The greater company and the increasing number of people who depend his life need to be organised by the government; c. Land should be under the authority of the State; and a big mining company should be operated as the state company (Sulistio, 2010).

However, there are other views given by the experts in relation to the meaning of "controlled by the state. Mohammad Hatta , for instance, in his book titled *Meninjau Masalah Koperasi*, stated that the Government's responsibility to protect the livelihood of the people and manage the production aim to organize prosperity of the people. The word Ruled is by no means that the Government itself is an entrepreneur in any form. The word "controlled" means also that the Government set up the production in order to benefit the welfare of the people.

The Minister of State Enterprises also argued in a written statement at the hearing the Court interpreted the "controlled state" means the State as regulator, facilitator, and the operator dynamically to the State only as a regulator and facilitator. Widjojanto in his Judicial Studies on Constitutional Court ruling of 2009, argued that the word "controlled by the State" in article 33 of the 1945 Constitution has a higher understanding or more extensive than ownership in the civil law conception. The concept of the State authority is a public law concept which relates to the principle of people's sovereignty in the 1945 Constitution, both in the field of politics (political democracy) as well as in economics (economic democracy). People recognized as a source, owner and the holder of the highest power in the life of the state, according to the doctrine "of the people by the people and for the people.

Similarly, the former Vice President of the Republic of Indonesia Dr. Mohammad Hatta at the end of 1977, argued: "The government building from the top, carries the big things such as developing electric power, drinking water supply, and manufacturing various products that dominate the life of many. What is called in English "public utilities" should be run by the Government. Owned by large companies that should be possible in the hands of the Government ". Also, Muhammad Yamin argues that the word owned by the State includes manage and arranging and / or operate to improve and enhance the production with emphasis on cooperative.

Bagir Manan, however, argues that the word the right of the State can be meant as (i) the State through the Government is the sole authority to determine the right to authorize resources including the earth, water and natural resources contained therein; (ii) Organize and supervise the use and utilization; (iii) Investments in the form of capital and the State enterprise's specific efforts.

In 2003 there was a debate that was mediated by the Constitutional Court on the word "controlled by the State". The Constitutional Court Decision argued that the word controlled by the State should be interpreted to include the meaning of the State authority in the broad sense sourced and originates from the conception of the sovereignty of the people of Indonesia on all sources of wealth "earth, water, and natural resources contained therein. It involves the sense of ownership of the public by the
collective people of the sources referred wealth. People collectively are constructed by the 1945 Constitution that gives mandate to the State to establish policies (regelendaad), management (beheersdaad) and supervision (toezichthoudensdaad) for the greatest prosperity of the people. There are many arguments have been advanced in the literature regarding the articles 33 of the 1945 constitution that cannot be elaborated one by one here. In short, the Article 33 of the 1945 Constitution did not reject the idea of competition among businesses, as long as the competition does not negate the State authority which includes the power to regulate, administer, manage and oversee the production branches which are important for the State and / or that dominate lives of many people for the purpose of the prosperity of the people.

Based on the above consideration and in view of Article 33 of the 1945 Constitution of 1945, the importance of the SOEs has been stipulated in Article 2 of Law No. 19 Year 2003. The SOEs should be directed to achieve sustainability of the national economy, especially the increase in performance and value of the company, as mandated by the People's Consultative Assembly (MPR) through Decree No. IV / MPR / 1999 on Guidelines of the State Policy 1999-2004, Chapter IV Economic Letter B number 12 and number 28, ruled that the State-Owned Enterprises should be organised in an efficient, transparent, and professional ways related to public interest in the provision of public facilities, security and defence industries, strategic asset management, and other business activities that are not carried out by the private sector and cooperatives. The existence and management of State-Owned Enterprises defined by law. Also, the government needs to assist the State-Owned Enterprises and Regional State Owned Enterprises that have business activities relating to the public interest. However, the State-Owned Enterprises that business activities are not related to public interest, it should be privatized through capital market.

Despite of the above laws, the Government has also made guidelines for SOEs that deals with detail matters relating to the mechanism of coaching, management, and supervision as in the Government Regulation No. 3/1983 which was further amended into the Government Regulation No. 12/1998 for Limited Company (Persero), the Government Regulation No. 13/1998 for Public Company (Perum), and the Government Regulation No. 6/2000 for Company Bureau (PERJAN). However, these various laws and regulations cannot be used as legal foundation in accommodating any recent changes associated with the enterprise development towards privatization and the implementation of the principles of good governance (GCG), namely, transparency, independence, accountability, and responsibility.

Due to the above conditions, the government immediately issued the law No. 19/2003 on State-Owned Enterprises. The issuance of this law made the following laws are no longer valid. These laws are as follows.

1. *Indonesische Bedrijven Wet* (IBW) Stbl.1927: 419 or the Corporate Law Indonesia. As several times amended and supplemented the latest by Law No. 12 of 1955 (LNRI 1955 No. 49, TLNRI No. 850). Example: Pawn Bureau, Bureau of Post, Telephone and Telegraph (PTT), Railway Bureau,

2. Law No. 19 Prp Year 1960 On the State Enterprise (LNRI 1960 59, TLNRI No.1989);


It should be noted that the law No. 19/2003, though it is the legal basis for the existence of state-owned enterprises in Indonesia, it needs also to comply with the law No. 40/2007 as well as the Law No. 25/2007 regarding Capital Investment. In the law No. 19/2003, there are criteria to be fulfill for the SOEs. These criteria are as follows.

1. In Article 1, paragraph 1 of the law No. 19/2003, as it is also stipulated in the Government Regulation No. 45/2005, it was mentioned that the State-Owned Enterprises (SOEs) is defined as a "business entity that all or most of its capital owned by the State through the direct sharing comes from the separate State assets.

2. The article 1 (2) states: Limited Company or locally called PERSERO is defined as a state-owned limited liability company whose capital is divided into shares of all or at least 51% (fifty one percent) of its shares owned by the Republic of Indonesia with the main objective is to obtain profit;

3. The article 1 (3), states: an open limited company is defined as a company where the capital and the number of share holders should meet certain criteria or a company that conduct a public offering in accordance with the legislation in the capital markets;

4. The article 1 (4) states that a Public Company or locally called PERUM is defined as a state company that is wholly owned by the State and is not divided into shares, which aims for the public benefit in the form of provision of goods and / or services of good quality and at the same time pursue profit based on company management principles. In addition to the above, it was also clearly stated in the Article 9 of the Law No. 19/2003 that SOEs consist of Limited company (Persero) and Public company (Perum).

The purpose of establishing SOEs has also been stated especially in the Article 2 of the law No. 19/2003. The objectives of SOEs are: (1) to contribute the development of the national economy in general and the state revenue in particular; (2) to obtain profit; (3) to hold public services in the form of provision of goods and / or services that are high quality and adequate for fulfillment of the people; (4) being a pioneer of business activities that cannot be implemented by the private sector and cooperatives; (5) Participate actively to provide guidance and assistance to employers which are economically weak, assisting cooperatives units, and other weak communities’ businesses. This suggests that the business activities of SOEs should not only focus on profit, but also to assist the disadvantage public business community.

In terms of the working capital, the SOEs used the separate state assets. This separate state assets is defined as the wealth of the State that are separated from the State Budget (APBN) used to serve as the SOEs’ capital investment, while the management of this capital investment is done by the SOEs. In addition, other financial sources of the SOEs are taken from reserve capitalization and other financial sources. However, due to the issuance of the Law No.17/2003, especially in the Article 1 paragraph (1), the State Finance is defined as all rights and obligations of which can be measured by money, and everything...

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in cash as well as goods which can be owned by the State in connection with the implementation of the above rights and obligations. In this law as mentioned in the Article 2, the state finance is defined as:

a. The rights of the state to collect taxes, disbursing and circulating money and loans;
b. The obligation of States to organize public service task of the State government and pay the bill to third parties;
c. State revenues;
d. State expenditure;
e. Regional revenues;
f. Regional spending;
g. State wealth or regional assets that are managed by the state or by others in the form of cash, securities, receivables, goods, as well as other rights that can be valued in money, including the separated wealth of the State companies and or Regional Companies;
h. Wealth other parties controlled by the government in the implementation of tasks of government and / or public interest;
i. Wealth other parties that obtained from using the state facilities.

There are pillars or principles in the State Financial Management mentioned in the law No. 17/2003. These pillars are annual pillar, universality pillar, unity pillar and specialty pillar as well as other new pillars including accountability, professionalism, proportionality, openness in state financial management, examination of state finances by the independent financial agency. However, there are legal differences concerning the capital aspect of SOEs as stipulated in Article 4 paragraph (1) of the law No. 19/2003 and the law No. 17/2003. In the article 11 of the law No. 19/2003, it was stated that for limited company (Persero) all the provisions and principles are applicable to this type of company as stipulated in the Law No. 40/2007 regarding the nature and characteristics of the company as a legal entity in that the wealth and debt of company is separated from wealth and debt of the board and shareholders.

The structures of the SOEs consist of: Board of Directors, and the Board of Commissioners, the shareholders and the Supervisory Board. These people are fully responsible for the supervision of state-owned enterprises as well as towards the objectives and profit orientation. These people have also to comply with the statutes of SOEs and legislation and are obliged to implement the principles of professionalism, efficiency, transparency, independence, accountability, and responsibility. They are prohibited from taking personal advantage either directly or indirectly from activities other than their own incomes. However, the member of SOEs’ Board of Directors may hold another position, as follows: (a) as a member of the Board of Directors in SOEs, locally-owned enterprises, private enterprise, and the position which may give rise to a conflict of interest; (b) Position in Structural and other functional agencies / central and local government agencies; and / or (c) Other positions in accordance with the laws and regulations. While the member of commissioners may not hold another position, as: (a) as a member of the Board of Directors in SOEs, locally-owned enterprises, private enterprise, and the position which may give rise to a conflict of interest; and / or (b) other positions in accordance with the laws and regulations.

The definition of privatization according to Law No. 19/2003 is the sale of shares, in part or in whole, to other parties in order to improve the performance and value of the company, to increase benefits for the State and society, as well as to broaden the ownership of public shares. However, privatization in Indonesia can be done in two ways, namely, direct sales (strategic sales) and sale of shares in the Indonesian stock Exchange (BEI). The purpose of doing privatisation explained in the Article 74 paragraph (1) and paragraph (2) of the Law No. 19/2003 are as follows. (1) Expanding community ownership towards the SOEs; (2) Improving the efficiency and productivity of the company; (3) Creating good and strong financial structures and financial management; (4) creating competitive and globally oriented SOEs; (5) Growing conducive business environment and good macroeconomic condition and market capacity. Whereas the goal of privatization is to improve the performance and the added value of the company and enhance public participation in the shares’ ownership of company.

The government is able to take action to privatise the SOEs after the Parliament approved the draft budget in which there are the target of state revenue from the privatization. The plan must be set forth in the annual privatization program, while the implementation of the plan should be consulted with the parliament. Privatisation should be done on the basis of the principles of transparency, independence, accountability, responsibility and reliability. However, the SOEs that can be privatised need to fulfil at least the following criteria. First, it should be an industry or sector that has competitiveness. The second is an industry or sector that has a rapid changing in technology. Whereas the SOEs that cannot be privatized are the SOEs that have scope of business which can only be maintained by the state, the SOEs which engaged in the business sector related with defence and security of the State, the SOEs in particular business sector that have specifically tasked to carry out certain activities related to the public interest, and the SOEs that engaged in the natural resources which by law is prohibited to be privatized.

Privatization can be undertaken by the following means. The first is by selling the shares as determined by the capital markets. This can be done via the sale of shares through a public offering (Initial Public Offering / Go Public), bond issuance conventions, and other equity securities. In this grouped, it includes the sale of shares to strategic partners (direct placement) for company registered in capital markets. The second is by selling shares directly to investors. This selling shares can be done directly to the state-owned investors. The Minister may make direct appointments. However, it should be in accordance to the law, the basic budget SOE concerned, and / or the shareholders agreement. Note that, the words "selling shares directly to investors" means that the sale of shares to strategic partners (direct placement) or to other investors, including financial investors. This method specifically applies to the sale of shares of Persero that are unlisted at capital markets. The third is through the sale of shares to the management (MBO / Management Buy Out) and / or employee (EBO / Employee Buy Out) concerned, namely, the sale of most or all of the shares
directly to the management and / or employees of company (Persero) respectively. In the case that the management and / or employees are not able to buy most or all of the shares, the offer to the management and / or employees is done by considering their ability. The word management here means the Direction. Note that for the SOEs (Persero) that are not wholly owned by countries, the implementation of the ministerial regulation should be consulted under the public annual shares meeting.

In terms of the procedures for Privatization. This can be done as follows.

1. The government needs to form a Privatization Committee as a coordinating media to discuss and decide privatization policy in connection with cross-sectoral policies;

2. Privatization committee should be chaired by the Coordinating Minister for the economy with the members include the Minister of Finance and other Technical Ministers where the SOEs involved in business activities;

3. Privatization Committee membership which is determined by Presidential decree;

4. Privatization Committee will: a. Formulate and establish general policies and requirements for the implementation of privatization; b. Sets out the steps necessary to expedite the process of privatization of state-owned; c. Discuss and provide an exit on strategic issues arising in the process of privatization of state-owned including those associated with the policy of the government sector;

5. Minister needs to select and establish a plan limited company to be privatized, privatization method used, and the type and range of shares to be sold. The results of selection and plans for privatisation are then derived in the annual privatization program. This annual privatization program is submitted to the Privatization Commission to obtain referrals and to the Minister of Finance for specific recommendations. This should be done no later than the end of the first month of the current budget year. Further, recommendation made by the Minister of Finance may be given at a meeting of the Privatization Committee as outlined in the privatization Committee's decision.

6. The Finance Minister needs to socialize annual privatization program. The socialization annual privatization program was conducted by companies, communities and other stakeholders, as well as through the press, or other media.

7 The minister needs to consult the privatization plans to the parliament;

8. The Minister will made policy decision after taking notes views given by the Privatization Committee and the recommendation of the Minister of Finance;

9. Minister is able to take the necessary steps such as the appointment of the profession and / or supporting institutions, drafting necessary agreement, the concept of association change, government regulations, and the implementation of the shareholders meeting in the implementation of privatization;

10. The Minister may establish a privatization team if privatization is conducted towards state shares or privatization of the state shares together with new shares;

11. Formation of the privatization team can be delegated to the Board of Directors only if it is necessary to expedite the process of privatization and / or administrative discipline of company. The membership of privatization team formed by the Board of Directors or delegated by the Minister that are from the outside of the SOE should be proposed by Ministers or officials designated by the Minister;

12. The Board of Directors may form a team of privatization if the privatization is carried out on new shares. The membership of privatization team formed by the Board of Directors from the outside of the SOE should be proposed by Ministers or officials designated by Minister.

13. The minister set of institutions / professions and other professions after going through a selection process conducted by the Minister or the team of privatization;

14. The cost in undertaking privatisation includes institutional cost and / or professions and other professions and operational cost of privatization.

15. The results of the privatization of state shares in Persero are remitted directly to the State Treasury;

16. The results of the privatization of shares in deposit cash deposited directly into Company (Persero) concerned;

17. The results of the privatization is the net result after deducting the costs of the implementation of privatization;

18. Administration and implementation of the privatization of the deposit are set as follows:

a. Guarantor of emissions or financial advisors may open account (escrow account) to collect the proceeds of privatization;

b. After deducting the costs of the implementation of the privatization, the underwriter or financial adviser is obliged to immediately deposit the net proceeds of privatization to the State Treasury and / or Persero treasury concerned;

c. Underwriter or financial adviser is obliged to immediately report the privatization of the deposit to the Minister, the Minister of Finance, and the Board of Directors Persero concern.

19. Other income earned on the escrow account of the results of privatization are taken into account as a result of privatization;

20. Verification of the costs and results of privatization by public accountants appointed by the Minister;

21. The sale of shares owned by the Republic of Indonesia on limited liability whose shares are less than 51% (fifty one percent) owned by the Republic of Indonesia conducted in accordance with the articles of association and shareholders' agreement as well as observing the principles set out in laws and legislation as well as regulations implementation of applicable;

22. The sale of shares owned by state enterprises in the limited liability company whose shares are at least 51% (fifty one percent) owned by the state conducted in accordance with the articles of association and shareholders' agreement as well as observing the principles set out in the legislation and its implementation regulations applicable;

23. The sale of shares owned by the Republic of Indonesia on the Open Persero be carried out based on the principles and provisions in the field of market modal.

Based on record made by the Indonesian Stock Exchange office, it was recorded that on Thursday, April 9, 2015, there were about 20 companies have been privatized and have sold their shares in the capital markets. These companies included PT Indofarma,Tbk (INAF), PT Kimia Farma, Tbk (KAEF), PT Perusahaan Gas Negara,Tbk (PGAS), PT Krakatau Steel,Tbk
PT. Adhi Karya (ADHI), PT Pembangunan Perumahan, Tbk (PTPP), PT Widjaja Karya, Tbk (WIKA), PT Waskita Karya, Tbk (WSKT), PT Bank Negara Indonesia, Tbk (BBNI), PT Bank Rakyat Indonesia, Tbk (BBRI), PT Bank Tabungan Negara, Tbk (BBTN), PT Bank Mandiri, Tbk (BMRI), PT Aneka Tambang, Tbk (AMTB), PT Bukit Asam, Tbk (PTBA), PT Timah, Tbk (TINS), PT Semen Baturaja, Tbk (SMBR), PT Semen Indonesia, Tbk (SMGR), PT Jasa Marga, Tbk (JSMR), PT Garuda Indonesia, Tbk (GIAA), PT Telekomunikasi Indonesia, Tbk (TLKM).

Whilst the SOEs that were privatized by way of direct sales is the Jakarta International Container Terminal (JICT) to Hutchison Port Holdings (HPH), a subsidiary of Hutchison Whampoa Limited (HWL) belong to the richest man Hongkong Li Ka-shing. Then there are PT Indosat Tbk (ISAT) was sold to Singapore Telecom (SingTel) in 2002.

PT Semen Gresik Tbk (SMGR), is the first state-owned enterprises listed on the Indonesia Stock Exchange (BEI) in Indonesia, and also an SOE first among eleven other SOEs to be privatized after the issuance of the privatization policy in 1998. The SMGR is a state that is engaged in the production of cement company was founded in 1957 during the old order. On July 8, 1991, SMGR listed on the Jakarta Stock Exchange and Surabaya Stock Exchange with the release of its shares to the public, making the company a first SOE to be listed on the stock exchange. The government holds a 73% stake after the IPO while the public holds 27% shares. In September 1995, SMGR releasing shares to the public through the Limited Public Offering I (Rights Issue I), which alter the composition of ownership to proportions of 65:35 between the government and the public. On 15 September 1995, SMGR consolidated with PT Semen Padang and PT Semen Santosa, formed PT Semen Gresik Group (SGG).

The case of privatization in the divestment / sale of shares of PT Indosat Tbk (Indosat) should be observed and analyzed as a precedent holding of lawsuits from the public by reason of "the lawsuit on the grounds of public interest" or action popularity. Although the lawsuit at the end was rejected, however, the arguments of the plaintiff deserves to be discussed. The applicant in the case is finally decided in the Supreme Court by No. Register No. 2280K / Pdt / 2005 consisted of 23 people, among others, Mahfud MD, AS Hikam, Marwan Coal, Adi Sasono, Zulkifilemansyah, Eros Djarot, Ichsanuddin Noorsy, Fahri Hamzah, Laode Ida and Drajad Wibowo ("Plaintiffs"). Whilst the "Defendants" means the Government c.q. State Ministry of "Defendants". It should be noted that at the time the lawsuit is shown, there is no Constitutional Court, which then formulates its interpretation of "the right to control the State". This suggests that privatization on one hand can be valuable and important, but on the other hand it can also be counter-productive if the impact reducing the value of the company at a cost that is also borne by minority shareholders and if implemented with violations of the GCG implementation.

In 2016, the Commission VI of the House of Representatives approved the privatization of four state-owned enterprises, Tbk. The decision was taken after the working committee meeting with Finance Minister Sri Mulyani, a meeting chaired by the Vice Chairman of Commission VI Dodi Reza Alex Noerdin. According to the privatization agreement is a consequence of the State Capital (PMN). The results of the meeting agreed to retain ownership stake of the Government by issuing new shares or rights issue by using PMN in APBN-P 2016. Four SOE approval privatization, among others: PT Wijaja Karya (Persero) Tbk., PT Jasa Marga (Persero) Tbk., PT Krakatau Steel (Persero) Tbk, and PT Pembangunan Perumahan (Persero) Tbk.

The investment given to the SOEs from APBN P 2016 was prioritized in the Government program that is useful for economic growth and welfare of the people, as Dodi said while chairing a meeting in the courtroom of Commission VI, Senayan, Jakarta, Wednesday (24/08/2016). Although it was given the approval of the privatization of four state-owned enterprises, the Commission VI of the House of Representatives noted that the government must considered the SOEs that are able to increase economic growth and the welfare of the people. It was approved that there are three sectors that should be given priority using the national budget (APBN-P 2016). These three sectors are the construction and energy sector, food sector and credit program for SMEs. The Commission VI also provides direction, in the disbursement of investment conducted and recorded in separate accounts. In addition, the parliament Commission VI also gave investment for the fast train project, either directly or indirectly. This policy is decided by the Commission VI with the expectations that there will be SOEs that received government budget able to improve Good Corporate Governance (GCG).

III. CONCLUDING NOTES

Privatization that can bring benefits to the Government and the people of Indonesia are privatisation that can improve the performance of SOEs, able to encourage SOEs to apply the principles of good corporate governance in the management of state-owned enterprises, able to improve access and competitiveness to the international market, able to push changes in work culture, and able to generate funds to cover the budget deficit, able creating a healthy business climate for its people, with the aim of promoting the general welfare or the welfare of the people of Indonesia. These expectations are in accordance with the Article 33 paragraph (2) and (3) of the 1945 Constitution.

However, this study argues that the privatization carried out today has no clear and strategic direction. The law No. 19/2003 on SOEs is still inadequate in providing policy guidance towards privatization. Thus, it is easy to understand if then, the policy and strategy of privatization currently is still not fit for the state purpose, constitution, and economic development concept. The present privatization policies and strategies tend to be more oriented to the sale of shares owned, with a maximum target price. The privatisation of SOEs is still very practical oriented and pragmatic, which is more precise to mention the divestiture rather than privatisation.

The direction and policy of privatization to date was also still not in line with the concept of economic development adopted in Indonesia. The 1945 constitution emphasised that the economy should be structured as a joint venture based on family principles. There are two words that are important in the economic development concept, namely "joint venture" and
"principle of the family. Joint venture is a business that is compiled and made that involve a shared vision between the three pillars of national economic actors, namely Governments, Communities, (consumers), and Manufacturers (market participants). Indonesia's economy must be prepared by accommodating the interests of the three pillars of economic agents in a balanced and fairness ways. These three pillars of economic actors must be contained in a range of economic policies, including the establishment of state-owned enterprises, management of state-owned enterprises, and privatization of SOEs. Whilst "family principle" is the principle of mutual cooperation or the principle of synergy of the three pillars the economic actors, the synergy between the government, the community and family principles referred market. The privatization should have a positive impact and healthy for the development or growth of the economic actors.

Privatization conducted to date, is also not in accordance with the 1945 Constitution. The problems lie in the existence of the SOEs and the privatization itself. The existence of SOEs in implementing economic policy, as mandated by the constitution remains unclear in terms of the definition, purpose, authority, supervision and inspection. There are many overlaps with each other, both at the level of legislation and in practice or implementation. Similarly, the activities of privatization itself which lost its strategic significance as an effort to improve the economy of the State. The implementation of the privatization program is more dominant in an attempt to divest or sell stock to save the state-owned and state expenditure only. These activities are indeed not in line with the constitutional mandate that requires a community-based economic policies, which means the privatization of justice for the people of Indonesia or privatization for the people.

When compared with the laws and regulations in other countries that regulate privatization, there needs to be a foundation of clear policies and procedures that detail the process and institutional management privatization program. For example, privatization in Malaysia have a firm direction statement alignments. Meanwhile, the Law on Privatization in Turkey provide clear direction, about alignments against the employee and the use of proceeds from privatization. In some other countries (including Germany and Malaysia), privatization is not limited to just selling state assets, but private participation in the activities of state / country at large. Thus, much remain to be done in the practice of privatization in Indonesia.

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**Liquid Fuel Production from Biomass Tar by Hydrogenation**

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**Abstract**— Bio-oils production studied from heavy tar which is organic phase of pyrolysis oil using CoMo/Al2O3 catalyst in the bench scale hydrogenation process. In this experiments, hydrogenation of biomass tar were carried out in varied reaction conditions to elucidate influence of operation factors. The effect of reaction temperature, retention time, feed rate, space velocity (SV), hydrogen concentration, and catalyst loading factor on bio-oil yield, carbon content, and carbon recovery of heavy tar by catalytic conversion was investigated. The six variables ranged from 300 to 500 °C for temperature, 0-140 min for retention time, 1, 2, and 3.3 g-tar/min for feed rate, 0, 1.0, 2.0, and 0.4 s-1 for SV, 25, 50, and 75 v% for hydrogen concentration, and 1, 2, 2.7 and 4.4 mg-tar /min/g-cat for catalyst loading factor. The product oils and gaseous species were analyzed by Karl Fischer moisture titrating analyzer, Total organic carbon (TOC) analyzer, GC – 14A gas chromatography, Agilent 3000 micro gas chromatography and elemental analysis. It was found that maximum bio-oil yield of 29wt% was obtained at 400°C, 60-140 min, 2 g-tar/min feed rate, 0.2 s-1 SV, 50 v% hydrogen concentration and 2.7 mg-tar /min/g-cat catalyst loading. In this study, it was able to produce a high quality liquid fuel with minimum water content 0.3wt% in oil phase and maximum level of HHV (39.8MJ/kg). The oil was also possible to produce multi-component fuels through the hydrogenation of bio-oils from heavy tar.

**Key words**— Bio-oil, Bio-oil yield, Catalytic conversion, CoMo/Al2O3 catalyst, Heavy tar

I. INTRODUCTION

Today there is a worldwide interest in the use of biomass as an environmental friendly renewable energy source. Many concerns point out to the need to use of renewable feedstock, composing the energetic matrix and replacing as much as possible the fossil fuels; among them could be mentioned the depletion of fossil oil reserves, constant uncertainties as far as price is concerned, unsecured supplies, and environmental pollution. Greenhouse effect and its consequences on climate change is one of the drawbacks resulting from the extensive use of this kind of fuels. These problems require the development of new alternative fuels such as biofuels. Biomass is a potential energy resource and there are several pathways (e.g. physical, thermal, chemical, and biological conversion) to generate energy from biomass. By the preceding methods, biomass could be converted to heat, electricity, solid fuels (coal), liquid fuels (bio-oil, methanol and ethanol) and gas fuels (hydrogen and syngas), respectively.

In the near term, biomass is the most likely renewable organic substitute to petroleum. Biomass is a renewable material containing appreciable quantities of hydrogen, oxygen and carbon. It is available from a wide range of sources such as animal wastes, municipal solid wastes, crop residues, short rotation woody crops, agricultural wastes, sawdust, aquatic plants, short rotation herbaceous species (i.e. switch grass), waste paper, corn, and many more. For hydrogen and syngas productions, the current biomass technologies include: pyrolysis, gasification, reforming (the most studied by researchers worldwide) and combustion. The pyrolysis of biomass without catalyst is a very simple and a cheap method for energy conversion. Pyrolysis is also a previous step to other thermo conversion processes, such as combustion and gasification. Valuable gases, such as hydrogen and carbon monoxide, can also be generated by pyrolysis.

This paper aims to give methods of hydrogenation liquefaction and liquid fuel production from heavy tar and their potential of development.

II. EXPERIMENTAL SECTION

A. Biomass Feedstock

Heavy tar, which is organic phase of pyrolysis oil was used as a feedstock in this hydrogenation process. Heavy tar used in this research was obtained from pyrolyzer in pilot scale three compartment internal circulating fluidized beds. The characteristics of heavy tar were carried out. The proximate analysis was done using ASTM method to determine the ash content, volatile matter content and fixed carbon content. While the moisture content of heavy tar was determined using Karl Fischer Moisture Titrating analyzer (MKA-610). Ultimate analysis of heavy tar was performed using an elemental analyzer (JMA-Auto Sampler 1000). In this experiment, CoMo/Al2O3 catalyst (HD Max 201 TRX 2.5, hydrotreating catalyst) was used.

III. EXPERIMENTAL SETUP

The experiments were conducted using a fixed – bed reactor in a batch process at atmospheric pressure. The height and inside diameter of the reactor were 558 and 152 mm.

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respectively. Two fluids nozzle was used in the evaporator. CoMo/Al2O3 catalyst was used in this study. Figure 1 showed the schematic diagram of experimental apparatus. This unit consists of burner, fixed – bed reactor, thermocouple to control the top and bottom temperature, feeder machine to supply the specified amount of feedstock into the reactor, gas flow meters to supply gases such as hydrogen, nitrogen and hydrogen sulfide, liquid collector to trap total liquid products, dry test gas meter and gas collection bags.

Figure 1: Schematic diagram of experimental apparatus

The experiment was started by heating the catalyst at 200 °C for 60 min to obtain anhydrous conditions. Then, the temperature was set to the desired value (300 – 500)°C in a stream of nitrogen at a heating rate of 10 °C/min. When the temperature of the reactor was reached, hydrogen, nitrogen, and hydrogen sulfide gases flow to the reactor. Experiments are performed at three gas flow rate (6, 12, 24) l/min. The organic phase (heavy tar) was injected into the vertical reactor at a feed rate of (1, 2, 3.3) g/min using a peristaltic pump. Each run lasted for about 30 min and longer time and was performed in triplicate.

During the process, the organic phase was evaporated due to the effect of the thermal conversion at reactor temperature. As the initial effect of the thermal reaction, a solid residue was formed on the top layer of quartz wool, derived from some of the ingredients of the organic phase. Furthermore, the vapors from the evaporation of the organic phase flowed downward and into contact with the catalyst, after which it passed through the cooler tube at 5 °C and finally flowed into a trap apparatus to condense as a liquid product. As a consequence, impurities were deposited on the surface of the catalyst and the presence of coke was indicated.

In this experiment, the amount of noncondensable gases was determined by the difference between the total weights of the organic phase (feed) and other products (oil, water, char, and coke). The liquid product was obtained in two immiscible layers defined as the oil and water fractions. The oil can be easily separated from the water fraction using a micropipette. After separation, each fraction was weighed separately, and the obtained values were then calculated using equation 1. Figure 2 showed liquid products with two immiscible layers from this experiment.

\[
\text{Yield (wt%) = } \frac{\text{product(g)}}{\text{feed(g)}} \times 100\% \quad \text{Eq. 1}
\]

Figure 2: Liquid products with two immiscible layers

The gas produced during hydrogenation process was collected in gas collection bag. The gas in the collection bag was analyzed using GC – 14A gas chromatography and Agilent 3000 micro gas chromatography.

IV. EXPERIMENTAL CONDITION

Table 1 showed hydrogenated gasification experimental conditions with H2S, 300ppm. This table was based on orthogonal design. We considered in three levels with hydrogen sulfide, nine experiments are totally required. Experiments were performed at three temperatures (300,400,500) °C using bench scale hydrogenation reactor.

| TABLE I: HYDROGENATED GASIFICATION EXPERIMENTAL CONDITIONS (H2S, 300ppm) |
|---|---|---|---|---|---|---|---|---|---|---|
| F | S | P | N | O | T | E | P | T |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.1 | 300 | 1 | 0.8 | 1.3 | 25 | 6 | 1.5 | 3.9 | 0.6 | 35 |
| 2 | 0.2 | 300 | 2 | 0.8 | 2.7 | 50 | 12 | 6 | 4.8 | 1.2 | 40 |
| 3 | 0.4 | 300 | 3 | 0.8 | 4.4 | 75 | 24 | 18 | 3.6 | 2.4 | 30 |
| 4 | 0.4 | 400 | 3 | 0.8 | 4.4 | 40 | 6 | 3 | 2.4 | 0.6 | 70 |
| 5 | 0.2 | 400 | 1 | 0.8 | 1.3 | 75 | 12 | 9 | 1.8 | 1.2 | 60 |
| 6 | 0.4 | 400 | 2 | 0.8 | 2.7 | 25 | 24 | 6 | 15.6 | 2.4 | 30 |
| 7 | 0.1 | 500 | 2 | 0.8 | 2.7 | 75 | 6 | 4.5 | 0.9 | 0.6 | 60 |
| 8 | 0.2 | 500 | 3 | 0.8 | 4.4 | 50 | 24 | 12 | 9.6 | 2.4 | 30 |
| 9 | 0.4 | 500 | 1 | 0.8 | 1.3 | 25 | 12 | 3 | 7.8 | 1.2 | 70 |

Moreover, experiments were carried out that it becomes catalyst temperature 400°C, SV 0.2 s-1 , H2 concentration 50 v% and catalyst loading factor 2.7 mg-tar /min/g-cat. Experimental conditions were shown in Table 2. It was used in our experiments because it has an obvious effect on the reaction with hydrogen sulfide additives.
TABLE II: LIQUID PRODUCTION EXPERIMENTS UNDER AN APPROPRIATE OPERATING CONDITION

<table>
<thead>
<tr>
<th>Exp: No.</th>
<th>SV , s⁻¹</th>
<th>Temp , °C</th>
<th>Feed rate, g-tar/m in</th>
<th>Catalyst load, mg-tar/min/g-cat</th>
<th>H₂ Con. v%</th>
<th>H₂S (3%), L/min</th>
<th>Retention time , min</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.2</td>
<td>400</td>
<td>2</td>
<td>2.7</td>
<td>50</td>
<td>0.12</td>
<td>0-30</td>
</tr>
<tr>
<td>1</td>
<td>0.2</td>
<td>400</td>
<td>2</td>
<td>2.7</td>
<td>50</td>
<td>0.12</td>
<td>30-60</td>
</tr>
<tr>
<td>2</td>
<td>0.2</td>
<td>400</td>
<td>2</td>
<td>2.7</td>
<td>50</td>
<td>0.12</td>
<td>60-140</td>
</tr>
</tbody>
</table>

V. RESULTS AND DISCUSSION

A. Nine of Each Experimental Result

The results obtained from nine of each experiment were presented in Table 3. As a result of carrying out nine sorts of experiment using the orthogonal table arranged by three levels with addition or without hydrogen sulfide, we confirmed an efficacy of hydrogen sulfide in almost all sorts of experiment in case of a hydrogen sulfide addition. Also we found out that there was an effect on high temperature side from the temperature of catalytic layer in a result of an oxygen content and energy recovery rate.

TABLE III: NINE OF EACH EXPERIMENTAL RESULT

<table>
<thead>
<tr>
<th>Exp: No.</th>
<th>Oxygen Content (wt% - d.a.f)</th>
<th>Carbon Balance (oil) (wt% - C)</th>
<th>Fuel Recovery Rate (wt% - tar)</th>
<th>Energy Recovery Rate ( % - tar )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24.7</td>
<td>33.9</td>
<td>38.7</td>
<td>34.1</td>
</tr>
<tr>
<td>2</td>
<td>27.6</td>
<td>26.9</td>
<td>37.3</td>
<td>26.3</td>
</tr>
<tr>
<td>3</td>
<td>31.5</td>
<td>25.8</td>
<td>34.3</td>
<td>23.6</td>
</tr>
<tr>
<td>4</td>
<td>27.7</td>
<td>6.1</td>
<td>7.7</td>
<td>6.0</td>
</tr>
<tr>
<td>5</td>
<td>14.0</td>
<td>42.7</td>
<td>42.8</td>
<td>42.2</td>
</tr>
<tr>
<td>6</td>
<td>13.0</td>
<td>65.5</td>
<td>72.3</td>
<td>63.9</td>
</tr>
<tr>
<td>7</td>
<td>19.0</td>
<td>18.6</td>
<td>24.5</td>
<td>17.9</td>
</tr>
<tr>
<td>8</td>
<td>14.3</td>
<td>56.2</td>
<td>66.5</td>
<td>53.7</td>
</tr>
<tr>
<td>9</td>
<td>9.6</td>
<td>46.8</td>
<td>45.1</td>
<td>45.4</td>
</tr>
</tbody>
</table>

The main purpose of experiment was to remove oxygen compounds in the oil phase. We observed that oxygen content of oil phase less than 10wt%. The presence of H₂S strongly decreased the hydro de - oxygenation (HDO) activity of the sulfided catalyst, and the ratio of the HDO reaction pathways depended on the H₂S concentration. The effect of H₂S addition on the activity and the stability of CoMo catalyst during hydrotreating of heavy tar were studied. A minimum concentration of hydrogen sulfide was usually required to maintain the catalyst in the sulfided state. In addition to desulfurization and changes in the structure of the active sulfided catalyst, the formation of coke and high molecular weight compounds on the catalyst decreased its activity but did not affect the selectivity of HDO. Figure 3 showed O/C and H/C ratios of hydrogenated gasification.

Figure 3: O/C and H/C ratios of hydrogenated gasification

The each factor’s effect for the hydrogenated gasification was found to be different by H₂S free and with 300ppm of H₂S. From the point of energy, the result with addition of 300ppm of H₂S was better than that of H₂S free. Moreover, it would be necessary for the future to find the optimum experimental conditions and feedstock in order to improve O/C and H/C ratios of product liquid fuels that of heavy oil.

B. Liquid Production Experiments under An Appropriate Operation Results

Table 4 showed liquid production experiments under an appropriate operation results.

TABLE IV: LIQUID PRODUCTION EXPERIMENT UNDER AN APPROPRIATE OPERATION RESULTS

<table>
<thead>
<tr>
<th>Exp: No.</th>
<th>Oil yield , wt%</th>
<th>Water content in oil phase, wt%</th>
<th>HHV, MJ/kg</th>
<th>Oxygen content, wt%</th>
<th>Carbon content, wt%</th>
<th>H/C , mol/ mol</th>
<th>O/C , mol/ mol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
<td>1.6</td>
<td>36.7</td>
<td>9.66</td>
<td>83.06</td>
<td>1.0</td>
<td>0.1</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>1.5</td>
<td>39.8</td>
<td>4.48</td>
<td>88.02</td>
<td>1.0</td>
<td>0.0</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>0.3</td>
<td>39.3</td>
<td>5.75</td>
<td>86.66</td>
<td>1.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

B.1. Product Yields

The result of product yields from heavy tar after Hydrogenation at 400°C was shown in figure 4. Hydrogenation process generate four products including a fuel-like oil, an aqueous phase liquid, non-condensable gases and coke. Bio oil yields ranged from approaching 4 to 29wt%, depending on the temperature and reaction time (our target to produce maximum oil yield). By-product yields including non-condensable gas, aqueous phase liquid and coke were decreased to longer time. So, longer time H₂S injection was taken liquid fuel yield increase and decrease of water content.
B.2. Carbon Balance

The result of carbon conversion from heavy tar was shown in Figure 5. Carbon amount of products oil can be measured by the analysis of their respective products. It is hard to obtain coke so carbon amount of coke can be calculated and estimated by various methods as follows: \[ C \text{ (coke)} = 100 - [C \text{ (gas)} + C \text{ (oil phase)} + C \text{ (water phase)}] \]. C (coke) is the amount of carbon included in cokes, C (gas) is the amount of carbon included in gas, C (oil phase) and C (water phase) are the amounts of carbon included in bio-oil.

B.3. Water Content

The result of water content for product oil was shown in Figure 6. According to this result, the total oil product has about 30% of water content and it was observed that the amount of water content was decreased with the increasing of reaction time in the case of just only focusing on the oil phase. Minimum water content contained 0.3wt% in oil phase compared to total product oil. The decrease of water content occurred catalyst regeneration by the formation of hydrocarbons. Moreover, reports written by Sharma and Bakhshi et al. showed also that approximately (2-5) wt% a small amount of water was remained in the total product oil after catalyst regeneration.

B.4. Higher Heating Value (HHV)

HHV was an essential parameter for determining the amount of energy content of fuel. The highest HHV obtained was 39.8MJ/kg take one’s time (30-60) min compare to 36.7MJ/kg take one’s time (0-30) min by using Dulong equation. Higher heating value was increased 10% from 36.7 to 39.8 MJ/kg. HHV of Wood pellet (18.8 MJ/kg) compare to product oil (39.8MJ/kg) so that it was shown approximately double efficiency. Bio-oil’s HHV is usually between 36 and 40 MJ/kg. The result of HHV was shown in figure 7.

B.5. Elemental Analysis

The result of elemental analysis in oil phase was shown in Table 5. The main purpose of this experiment was to remove oxygen compounds in oil phase which has increasing effect of hydrocarbon compounds. We observed that oxygen content of oil phase less than 10wt%. Oxygen content was decreased to
about 4.48wt%. Carbon content of oil phase was quite higher than that of heavy tar. It was observed that sulfur and nitrogen contents were lower in all oil products.

### TABLE V: RESULT OF ELEMENTAL ANALYSIS IN OIL PHASE

<table>
<thead>
<tr>
<th>Sample</th>
<th>Time</th>
<th>Elemental Analysis (wt%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>C</td>
</tr>
<tr>
<td>1</td>
<td>0-30</td>
<td>83.06</td>
</tr>
<tr>
<td>2</td>
<td>30-60</td>
<td>88.02</td>
</tr>
<tr>
<td>3</td>
<td>60-140</td>
<td>86.66</td>
</tr>
</tbody>
</table>

#### B.6. H/C and O/C Ratios of Product Oil

When oil is used as fuel, it is important to determine ratios of atomic H/C and O/C. Generally, increase of H/C ratio results in high value products such as gasoline. However, increase of O/C ratio brings out a converse result as well. Duman et al. reported that activity effect of de-oxygenation in catalytic cracking is favorable and causes increase of H/C ratio. There was observed no change in H/C ratio of product oil. It was observed that O/C ratio decreased a little with increasing of reaction time. Some studies also reported that low H/C ratio describes increase of aromatic compounds in oil products. O/C ratio very close to that of gasoline, but H/C ratio far from gasoline however, product oil used as transportation fuel. The result of H/C and O/C ratios in oil phase was shown in figure 8.

![Figure 8: H/C and O/C ratios of product oil](image)

#### VI. Conclusion

This research showed that the recovery of liquid fuel from heavy tar, which is organic phase of pyrolysis oil was successfully performed using a catalytic conversion. This experiment also confirmed that the temperature and reaction time have a significant effect on the distribution of product yields obtained from the catalytic conversion. A temperature of around 400 °C and longer time were found to be most suitable for catalysts to perform the de-oxygenation activity, which Meiktila Township, Myanmar, moethandakyi@gmail.com caused an increase in the production of water and gas. In this study, it was able to produce a high quality liquid fuel with minimum water content 0.3wt% in oil phase and maximum level of HHV (39.8MJ/kg). The oil was also observed to have an abundant amount of aromatic compounds. Finally, we concluded that the characteristics of product oil were very close to those of gasoline and that the product oil has the potential to be used as a transportation fuel.

#### ACKNOWLEDGMENTS

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#### REFERENCES


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Material Optimization and Analysis of Cryogenic Pressure vessel using FEA

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Abstract- Cryogenic engineering is concerned with low temperatures and the equipment used in producing, storing and using of fluids at low temperatures. Due to the increasing use of cryogenic-fluids in industrial applications, the storage and transport of cryogenic fluids has become a necessity. Because of low temperatures, the storage of cryogenic fluids is difficult. Cryogenic fluids must be maintained at low temperatures and high pressures, otherwise the phase change may occur, and storage of cryogenic fluids is possible with insulated chambers, using fiber, foamed or powdered insulation. In the present work, design analysis of multi layered cryogenic shell, with optimum orientations; minimum mass under strength constraints for a cylinder subjected to axial loading for static analysis on the pressure vessel has been studied. The modeling is carried out in Creo Parametric 2.0 and the analysis is carried out in ANSYS 15.0 solver. Static analysis and Thermal analysis has been done and also material optimization is done for enhancement. Different materials are analyzed. Taking weight into consideration and stress into account, S-glass epoxy for the outer structure with aluminum for the inner structure is comparably better than the other materials.

Index Terms- Creo parametric 2.0, design optimization, weight reduction, hybrid.

I. INTRODUCTION

The denotation “cryogenics” is defined as the study of a liquefied gas at very low temperature (below−150°C), as well as how materials perform at the aforementioned temperature. At cryogenic temperature all gases are in liquefied form. For example at -162°C temp. Methane is in liquefied form and it has 580 times less volume when it is at room temperature. So it is possible to transport large quantity of methane in small tank.

At current scenario size of Industries are becoming smaller. Medium sized and contract base industries are developing very rapidly. This kind of industries require medium sized cryogenic tank which can transport 1000 to 4000 liters of cryogenic liquids. Current requirement of industries is a tank which can transport required quantity of cryogenic liquids and which can be also works dually as transportable or stationary storage.

The cryogenic fluid has been liquefied and purified to the desired level; it must then be stored and transported. Cryogenic fluid storage-vessel and transfer line design has progressed rapidly as a result of the growing use of cryogenic liquids in many areas of engineering and science. Storage vessels range in type from low performance containers, insulated by rigid foam or fibrous insulation so that the liquid in the container boils away in a few hours, up to high performance vessels, insulated by multilayer evacuated insulations so that less than 0.1 percent of the vessels content is lost per day.

A pressure vessel is a closed container designed to hold gases or liquids at a pressure substantially different from the ambient pressure. Pressure vessels are used in a variety of applications in both industry and the private sector. They appear in these sectors as industrial compressed air receivers and domestic hot water storage tanks. Other examples of pressure vessels are diving cylinders, recompression chambers, distillation towers, pressure reactors, autoclaves, and many other vessels in mining operations, oil refineries and petrochemical plants, nuclear reactor vessels, submarine and space ship habitats, pneumatic reservoirs, hydraulic reservoirs under pressure, rail vehicle airbrake reservoirs, road vehicle airbrake reservoirs, and storage vessels for liquefied gases such as ammonia, chlorine, propane, butane, and LPG.

II. PROBLEM IDENTIFICATION

Mobile vessels are used widely from decades on railway and vehicles to carry various liquids from water to petrol products and lastly even liquefied gases. During this time there was a huge development in the field of tank structures, materials and manufacturing processes. Nowadays tanks are able to carry not only one type of fluid but the whole family of fluids with similar properties. Due to the differences in liquids density and limitations in permissible loads or requirements for carrying some liquids it may appear that tank will be filled up only in the part of its nominal capacity. It means that during operation liquid sloshing within the tank.
To avoid unexpected forces during that process vessels are equipped with surge plates. Such cases are regulated by international standards. According to [1] each vessel that is provided to carry liquids which capacity is less than 80% of nominal tank capacity should be equipped with surge plates. Such plates should also resist on dynamic forces that appear during vessel operation. For example tanks that might be used on railway have to fulfill requirements which are acceleration +/- 2g longitudinal and +/-1 g transverse direction.

The present study was intended to develop a concept for a Cryogenic vessel, with the motivation of Technical gases becomes liquid in extremely low temperature ranging minus 200 °C and very high pressure what makes that transportation devices have to perform very strict requirement.

Many papers were devoted to the optimization of Cryogenic vessels. These papers are to support and enlighten the whole process of design in the specific area. Journal papers and patents explored here are related directly or indirectly to the proposed area of work that is design and development of a Cryogenic vessel.

III. MODELING OF CRYOGENIC PRESSURE VESSEL

The modeling of the cryogenic pressure vessel is done in Creo Parametric 2.0.

Introduction to Creo Parametric:

Creo Parametric is a computer graphics system for modeling various mechanical designs and for performing related design and manufacturing operations. The system uses a 3D solid modeling system as the core, and applies the feature-based, parametric modeling method. In short, Creo Parametric is a feature-based, parametric solid modeling system with many extended design and manufacturing applications.

Creo Parametric is the first commercial CAD system entirely based upon the feature-based design and parametric modeling philosophy. Today many software producers have recognized the advantage of this approach and started to shift their product onto this platform.

Creo Parametric was designed to begin where the design engineer begins with features and design criteria. Creo Parametric's cascading menus flow in an intuitive manner, providing logical choices and pre-selecting most common options, in addition to short menu descriptions and full on-line help. This makes it simple to learn and utilize even for the most casual user. Expert users employ Creo Parametric's "map keys" to combine frequently used commands along with customized menus to exponentially increase their speed in use. Because Creo Parametric provides the ability to sketch directly on the solid model, feature placement is simple and accurate.

The model is as shown in the figure 1 as shown below:

![Fig. 1.Cryogenic Pressure Vessel Model](image)

The drawing Specifications taken are as shown in the Figure 2 below:
IV. ANALYSIS OF CRYOGENIC PRESSURE VESSEL

The analysis of the Cryogenic Pressure Vessel is done in Ansys 15.0 and the analysis reports are as shown below. The geometry and the mesh model in Ansys are as shown in the Fig. 3 and Fig. 4 below respectively.

Analysis of Steel Cryogenic Pressure Vessel:

The analysis is carried out for the Steel material and Different materials are being analysed for different conditions and materials used are Structural steel, Stainless steel, Aluminium and S-glass epoxy for the outer structure with aluminium, copper and stainless steel for the inner structure of the Cryogenic Pressure Vessel.
The Boundary Conditions are given Temperature of -173 degree C. Convection along with Inner pressure of 0.7 MPa also with Vacuum pressure along the inner and outer tubes. The deformation and Equivalent Stress reports for the steel Cryogenic Pressure Vessel with Aluminium inner section are as shown in the Fig. 5 and Fig. 6 respectively.

Fig. 5 Deformation of the Steel Cryogenic Vessel  Fig.6 Equivalent Stress of the Steel Cryogenic Vessel

The deformation and Equivalent Stress reports for the composite Cryogenic Pressure Vessels with Copper inner section are as shown in the Fig. 7 and Fig. 8 respectively.

Fig. 7 Deformation of the Steel Cryogenic Vessel  Fig.8 Equivalent Stress of the Steel Cryogenic Vessel

Also the analysis is carried out for the cryogenic pressure vessel which consists of iterations of stainless steel and also glass epoxy composite material. The deformation and the Equivalent Stress reports for the glass epoxy with Aluminium inner position Cryogenic Pressure Vessel are as shown in the Fig. 9 and Fig. 10 respectively.

Fig. 9 Deformation of the hybrid Cryogenic Vessel  Fig.10 Equivalent Stress of the hybrid Cryogenic Vessel
The deformation and the Equivalent Stress reports for the glass epoxy with Copper inner position Cryogenic Pressure Vessel are as shown in the Fig.11 and Fig. 12 respectively.

Fig. 11 Deformation of the hybrid Cryogenic Vessel  Fig.12 Equivalent Stress of the hybrid Cryogenic Vessel

The deformation and the Equivalent Stress reports for the stainless steel with stainless steel inner position Cryogenic Pressure Vessel are as shown in the Fig.13 and Fig. 14 respectively.

Fig. 13 Deformation of the SSCryogenic Vessel  Fig.14 Equivalent Stress of the SSCryogenic Vessel

Here analysis of cryogenic vessel done for outer vessel and inner vessel material changes, such as stainless steel, Glass epoxy, Aluminium and Structural steel for outer vessel. For inner vessel material used as copper, aluminium, stainless steel. Analysis is done for following aspects.
- Temperature
- Heat Flux
- Equivalent Stress
- Equivalent Strain
- Deformation and
V. RESULTS AND DISCUSSION

The results for the cryogenic pressure for different variations are as shown below:

<table>
<thead>
<tr>
<th>Outer Vessel</th>
<th>Inner Vessel</th>
<th>Stress (Mpa)</th>
<th>Strain</th>
<th>Deformation (mm)</th>
<th>Heat Flux</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural steel</td>
<td>Aluminum</td>
<td>124.37</td>
<td>0.014</td>
<td>2.750</td>
<td>0.126</td>
<td>188.84</td>
</tr>
<tr>
<td>Structural steel</td>
<td>Copper</td>
<td>112.39</td>
<td>0.012</td>
<td>2.389</td>
<td>0.012</td>
<td>234.40</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Aluminum</td>
<td>124.40</td>
<td>0.014</td>
<td>2.737</td>
<td>0.133</td>
<td>101.34</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Copper</td>
<td>112.42</td>
<td>0.012</td>
<td>2.377</td>
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<td>146.00</td>
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<td>Aluminum</td>
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<td>2.488</td>
<td>0.03262</td>
<td>139.18</td>
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</table>

VI. CONCLUSION

This project work involves the comparison of material optimization of cryogenic pressure vessel under static loading conditions. The model is preferred of in Creo Parametric 2.0 and then analysis is performing through ANSYS 15.0. The Cryogenic pressure vessel is modeled in Creo Parametric 2.0 and analysis is carried out in Ansys 15.0. The analysis carried out is under static loading condition and also thermal base conditions. Different materials are being analyzed for different conditions and materials used are Structural steel, Stainless steel, Aluminum and S-glass epoxy for the outer structure with aluminum, copper and stainless steel for the inner structure. Taking weight into consideration and stress into account, S-glass epoxy for the outer structure with aluminum for the inner structure is comparably better than the other materials.

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Business innovation on discontinuity of satellite legacy business in Indonesia: A lesson from SBU Metrasat change management

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Abstract—This research aims to formulate strategic change management in SBU Metrasat Indonesia, by identifying internal and external driving factors of the company, developing new business strategies, and formulating corporate change programs to achieve SBU Metrasat’s competitive advantages. The research approach was through a case study with descriptive methods, and qualitative and quantitative analysis. The results of the analysis show that the type of changes are categorized into transition. The company establishes three priority strategic change managements, which should be made in nine elements of business model canvas. However, to achieve the innovative value, SBU Metrasat should focus on elements of value proposition, key resources, key activities and key partners. The McKinsey 7S analysis found that structure and skill are two elements which become barriers to change. The strategic change management plan within the next five years at SBU Metrasat would execute only 6 of the 8-step change management model proposed by Kotter (1996).

Index Terms—Change management, business canvas model, model 7S Mckinsey, 8 tahapan Kotter, satellite communication services.

I. INTRODUCTION

Currently, SBU Metrasat is the market leader in the satellite communications services, with revenues of Rp 1.48 trillion in 2015 and occupied 27% market share in 2014. The compound annual growth rate (CAGR) from 2010-2015 was 30.1%. By 2016, the revenue growth of SBU Metrasat was only 10%, this number is smaller than the growth in the previous 6 years. Satellite communication service is the substitution product in telecommunications services, which serve for regions with no fiber optic and radio infrastructure. However, the construction of fiber-optic infrastructure based broadband network has been deployed in eastern part of Indonesia that previously could only be served by satellite communication services.

Indonesia Digital Network program which is realized through construction of inter cities network infrastructure and network access by Telkom aims to support the development of the digital society by providing broadband infrastructure thoroughly and integrally (Telkom, 2014 Annual Report). Until the end of 2014, Telkom has built fiber-optic based backbone network throughout 76,700 km. Starting in 2016, the broadband network development will steadily rise along with the development programs by the Government. Telkom Indonesia develops the broadband network known as id-Ring. The id-Ring via the eastern part of Indonesia has been installed and operating by 2014. At the end of 2015, development of id-Ring network via the southern route of Eastern Indonesia began, and by 2016, the networks were integrated and now fully operate. Such construction directly decrease the revenue growth of SBU Metrasat.

BAPPENAS (2014) in the Indonesia Broadband Plan 2014 – 2019 has arranged programs to strengthen National Connectivity in ICT (information communication technology). In 2019, the construction of the planned national broadband provides 20 Mbps (mega bit per second) fixed wireless access to 71% of households in urban areas and 30% of the total population, as well as 1 Mbps mobile access to the whole population. In rural areas, the fixed wireless broadband infrastructure is expected to reach 49% of total households (10 Mbps) and 6% of the population, as well as mobile access to 52% of the population (1 Mbps). The construction of broadband networks using fiber optic is estimated to finish in 2019. Hence, in the future, there will be discontinuity based legacy satellite services, which the stream of 65% of SBU Metrasat revenue.

Kotter (1996) states that building a sense of urgency is very important to create necessary cooperation, as transformation attempts will fail to achieve organization goals, when the organization is still in the comfort zone. Anderson (2001) states that changes are happening in all areas, as speed and complexity rise in the 21st century, and the future success of the organization depends on how the leader deal with changes.

On the other hand, referring the Deloitte (2013), there are 5 million households demanding internet services that the wired or mobile services could not offer. And there are 2 million households with income greater than Rp 5 million a month, that could potentially need the internet service; the number is projected to rise up to 9 million in 2018. Eventually, the demand can only be served by satellite infrastructure. In addition, the better access to technology and high number of internet users in Indonesia, have enhanced connectedness between consumers and sellers. Such relation contributes to the change in buying behavior of Indonesian society. Sales through e-commerce is estimated at USD 13,716 million by 2016, and the sales growth that is CAGR in 2016 – 2020 is 16.86%; the number of e-
The sampling technique was purposive, nonprobability sampling, a sampling based on specific criteria. The questionnaires were distributed to internal respondents, who were key persons in the SBU Metrasat and specialized in the operational of the company, and members of company management with working experience of at least three years at SBU Metrasat. Meanwhile, the external respondents were professionals having business relations and experts or associations in the industry of satellite communication services.

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Position</th>
<th>Organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>Managing Director</td>
<td>SBU Metrasat</td>
</tr>
<tr>
<td></td>
<td>GM</td>
<td>SBU Metrasat</td>
</tr>
<tr>
<td></td>
<td>Manager</td>
<td>SBU Metrasat</td>
</tr>
<tr>
<td></td>
<td>Senior Engineer</td>
<td>SBU Metrasat</td>
</tr>
<tr>
<td>External</td>
<td>Chief of ASSI</td>
<td>ASSI</td>
</tr>
<tr>
<td></td>
<td>Director</td>
<td>Patrakom</td>
</tr>
<tr>
<td></td>
<td>Chief of T3S Project</td>
<td>Project Satellite</td>
</tr>
<tr>
<td></td>
<td>SA Director of Telkom</td>
<td>T3STelkom</td>
</tr>
<tr>
<td></td>
<td>Senior Engineer</td>
<td>Telkom</td>
</tr>
</tbody>
</table>

The purposes of this research are (1) to analyze the internal and external driving factors faced by the company in strategic change management; (2) to analyze and develop a new business strategy to maintain the continuity of the business in the satellite communication services industry; (3) to study the implementation of change management as well as conducting an analysis of the driving factors and barriers to face resistance to change; and (4) to formulate the change programs at the company.

II. RESEARCH METHODOLOGY

The research was conducted at SBU Metrasat Jakarta, from May until December 2016. This was a case study with descriptive, qualitative, and quantitative analysis methods. The research data was primary and secondary data. Primary data was obtained from direct observations, questionnaire, interviews with the internal and external parties of the organization, and also a focus group discussion (FGD). The secondary data was derived from the findings of of market research on internet services via satellite, literature review, studies, scientific journals, related literature, magazines, and from relevant institutions.

Driving Factors of Change

The driving factors identified were sorted according to the respondents. The top 5 priority external driving factors being analysed are given as follows (a) focusing on the customer, (b) demands for high-speed service, (c) demands on high quality of the service, (d) fast in maintaining troubleshooting, (e) user friendly services. The results of the analysis on 5 internal driving factors are as follows (a) developing and sale of new products to a new segment, (b) shifting from internal focus to become market and customer oriented, (c) building strength in the marketing and product development units, (d) entrepreneur leaders should take action and keep learning, unlike the previous ones who only do concepts and plannings, (e) corporate restructuring, according to the requirement of market.

The result of the external driving factors namely focusing on customers, the demand for high-speed services and speed in Repair interruption is similar to the results of Menkhoff and Chay (2008). It strengthens the findings of research by Ghezzi (2013) that development feature of the device becomes the driving factor of the sustainability of the service. The internal driving force factors develop new products and marketing to new segments for the company according to the results of the research of Herdyana (2014) that the growth of its business portfolio and business in new industries. Also, according to the results of the research of Ghezzi (2013) the internal driving forces of factors continuity of the service is the ability to deliver new services through innovation. And the fourth internal driving factor is the entrepreneur leader changes from previously only focusing on
conceptual stages and planning, and strengthening research of the internal driving factors by Menkhof & Chay (2008) on the effectiveness of practical company management.

The impacts of external or internal strategic changes deserve attention from the organization (Saleh 2012 and Herdyana 2014). From the study in SBU Metrasat, there is an order of priority based on the degree of influence each strategy based on the respondents’ answers, and data observation on business activity in the company. The results of the analysis are:

(a) focusing on customers (b) developing and sale of new products to a new segment, (c) entrepreneur leaders who take action and keep learning, unlike the previous ones who only did concepts and plannings. Talpau and Bosc (2011) explain that customer orientation means the company treats customers as the top priority, always focuses on the dynamics and development of customers in designing strategies and providing appropriate and excellent service to target customers, believes and consistently puts the customer needs and satisfaction at the highest priorities, and always perceives business from the customer viewpoint.

Bass in Singh (2013) opines that transformational leaders have four criteria i.e. influence, motivation that inspires, encouraging learning and personal considerations. These criteria are the bases for entrepreneurial leaders in change management; they were initially in the concept and planning stage, but dare to take action and keep learning. Singh (2013) also states, that leaders should be able to make their followers manage to work above their ability by evoking feelings and proactively motivating the followers, giving renewed hope for the followers, creating an opportunity for learning, giving the stimulation to them to create good governance, and lastly, creating solutions to problems.

Analysis of the type of changes to the company by Anderson and Anderson (2001) found the SBU Metrasat’s type of change is transition. This is based on, first, the organization does not have to change aspects of organizational culture, behavior and mindset. Second, the organization does not change all the aspects, but only performs alignment and additions to the structure, products or services, and technology to meet customer needs and market changes. Third, the organization has started the process of changing of the company after clearly understands and defines its objectives. And the process of changes can still be managed or controlled in accordance with the objectives in the known future.

**Organization’s Goals and Objectives**

Hamel and Prahalad (1994) states the strategic change management is actually the planning to achieve global long-term goals and has clear competencies to be prepared, but not including the detailed planning. The purposes of changes in the SBU Metrasat is based on interviews, company’s reports, and analysis business canvas model. The plan of corporate development in the five years ahead is to maintain as the market leader in satellite communication services industry. To implement the planning, the organization determines strategic change management priorities, namely (a) focusing on customer by providing satellite services at competitive prices, (b) developing new product, along with innovation and broadband internet mediahub, (c) serving a new customer segment at the adjacent satellite communications services industry.

Kim and Mauborgne (2006) explain in a blue ocean strategy of development, that a company proposes a superior offer and creates new markets, as well as innovating values. The objectives and targets of the company change through satellite service products with competitive prices are set in business model canvas of SBU Metrasat in the next five years. According to Ostewalder (2012), to reach innovative values, there are four challenging questions about strategy and business model, namely (1) What factors should be eliminated? (2) What factors should be reduced in order for the service to be under the industry standard? (3) What factors must be added in order for the service to be above the industry standard? (4) What factors should be created that are unable to compete? The formulation of the organizational changes in the business model canvas for the next five years based on the four challenging factors above can be seen in Figure 1.

Changes at SBU Metrasat in the next five years are clearly illustrated with BMC above. The identification and analysis of the changes at the SBU Metrasat have been undertaken through the nine elements of the business model canvas; these elements are interrelated to each other, thus if one element changes, it will impact the other elements. The strategy to reach the value of innovation (Ostewalder and Pigneur 2010) requires the company to make changes in several elements, namely value proposition, key resources, key activities and key partners.

The change elements have to be as follows: first, providing services in all Indonesia including the remote area, and the satellite services based on quota usage, this is certainly that the competitors are unable to offer. Secondly, the company should eliminate the use of large antenna, abolish outright sale scheme, and delete premium operation for special customer. Third, the organization is required to utilize HTS satellite and...
implement all activities through resource sharing. Forth, the company has to offer their services in a lower yet competitive price.

Analysis of Change Management in the Company

Analysis of the change to the organization is by using the McKinsey 7S model approach. The analysis is based on data of respondents and the discussions with company management. Elemental analysis firm found that there are two elements in the range of -4 to +4, namely structure and skill. Biech (2000) states element "S" in the range of -4 to +4 means known elements as a problem. Detailed results of the analysis are shown in Table 2.

Table 2 Analysis of 7 elements of the company using McKinsey’s 7S model.

<table>
<thead>
<tr>
<th>Unsur</th>
<th>Σ Nilai</th>
<th>Hasil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic</td>
<td>+2.5</td>
<td>+7.0</td>
</tr>
<tr>
<td>Structure</td>
<td>-0.375</td>
<td>-0.88</td>
</tr>
<tr>
<td>System</td>
<td>+2.65</td>
<td>+6.63</td>
</tr>
<tr>
<td>Skill</td>
<td>+1.75</td>
<td>+3.63</td>
</tr>
<tr>
<td>Style</td>
<td>+2.65</td>
<td>+7.38</td>
</tr>
<tr>
<td>Staff</td>
<td>+2.25</td>
<td>+6.50</td>
</tr>
<tr>
<td>Share value</td>
<td>+3.75</td>
<td>+11.38</td>
</tr>
</tbody>
</table>

Strategic becomes the driving factor, as the strategy of SBU Metrasat has been defined clearly and contains shared goals among the employees. This is consistent with planning and implementation stages as a continuous process. The employees understand their position in a series of necessary process, which smooths the strategic implementation of the company. Hrebiniak (2005) explains, clear strategy could provide a guideline that helps in the implementation.

Structure as a barrier factor, because of inefficient coordination as responsibilities in organizational structure are not evaluated and directed to the new goals of the company. The current organizational structure does not affect the smooth flow of information and coordination between units, inefficient control and the decision-making process in the organization. Hubeis and Najib (2008) describe that the change in strategy led to changes in organizational structure.

System is found as a driver, as no barrier communication in the company, the process has been running in accordance to operational standards, where there are regulations as functional control, and several units started the implementation of IT system at business activity. A good system, if the standard operating procedures and rules are used as control, and open communication vertically could reduce hierarchy, so that it can accelerate the strategy implementation effectively (Hrebiniak 2005). Higgins in Donselaar (2012) states the effectiveness of the system based on implementation of strategy can help realize the changes.

Skill is identified as a barrier factor, due to not yet optimum development of skills, less appreciation to appropriate of skill, new business, and small opportunity for career development. Identification of main competences required for businesses is needed to achieve and sustain market position as a leader (Drucker 1995). Hrebiniak (2005) states that a company has competence and capability that is not possessed by competitors and uneasy to develop; this eventually would give a huge impact on the profit gained and determine the success of the company’s strategy.

Style has been identified as the driver, because of the leader’s presence in the organization, and also there is leadership impact to the management and the employees in any level. There is a great support for employees to make improvements or innovations as well as appreciation on the input and ideas, which are taken into account in the decision making at SBU Metrasat. Jooste & Fourie in Donselaar (2012) argue that style becomes an important driving factor in implementation of strategic change management for the top leaders, and also a key to the managerial success. The style in the operational levels implemented through the attitude and behavior of people in the organization.

Staff is identified as a driving factor. This is based on the fact that the staff come from diverse backgrounds but are aligned with the strategic changes. Indeed, human resources can support implementation of strategic changes effectively. Drucker (1995) suggests that a company requires staff with the ability to fill and cover the weaknesses of counterparts in their team, to adjust their strengths and weaknesses, and are able to change to suit the demands of responsibility required by the organization.

Shared value is also becoming a driving factor based on the trust and transparency in the corporate environment. This is seen from implementation of business ethics in activities within open and supportive environment. Jooste & Fourie in Donselaar (2012) point out that shared value could encourage or restrict strategic change management, depending on the implementation. The alignment between the corporate culture, strategy, ethics, and the core competencies of the company creates the shared value within the company.

The ‘S’ elements of company structure and skill are as the barrier factors, SBU Metrasat should increase the effectiveness of the strategy implementation. Malan (2003) and Ravanfar (2015) believe that upgrading performance to suit the changes can be done by improving the strategy, simplifying the mechanisms of the process, making the function between units interrelated, facilitating communication, and increasing control using the IT system. Hubeis and Najib (2008) argue that the change strategies will result in changes to the organizational structure, since the change in strategy requires the organization to allocate resources to adjust to the goal of the new strategy. To enhance skill, it needs to improve knowledge from multidiscipline.

Action Plan

The results of the analysis of SBU Metrasat type of change is "transition", the Kotter’s 8 steps of change model (1996) actually would be implemeanted as a whole if the company is having a transformational type of change (Sidorko 2008, 2012 and Herdyana Saleh 2014). The management changes at SBU Metrasat according to Kotter’s 8-Step are as follows:

Establishing sense of urgency. The change efforts can successfully begin with an evaluation by individuals and groups over the competition in the industry, market, technology trends and financial performance. Based on the analysis of the driving factors, there have been changes in the market, namely the demand for high-speed, high quality, and easy services. In addition, there is a shifting demand to develop new products. The
results of such analysis on the internal and external factors are responded by SBU Metrasatin conducting changes.

The need for changes must be supported by the employees and management team. If the changes do not yet start, some profits for the company might be lost. However, the changes must be carried out with plans; if not, the changes would be weak and raise problems for the employees to adapt.

Some of the following programs are expected to increase the sense of urgency for changes at the SBU Metrasat: performing intensive and persuasive communication, communicating the message as well as the importance of such changes, having a sharing session between the management team and employees about the company’s condition that suffers and experiences declined performance in the existing business.

**Building coalition.** There is no single person who is able to lead and manage the process in organizational changes alone. To achieve the success in changes, it is necessary to build a guiding coalition. The guiding coalition will give significant values in the phases of change so that the process can persistently continue.

To build an effective guiding coalition, there are four major characteristics that should be taken into account, i.e. the teams made up of important people in a particular company, such as managers; expertise; representation from all relevant fields and backgrounds, such as disciplines, skills, experience, nationality, tribe/race, and; third, strong credibility and leadership so as to encourage the process of change.

To establish a guiding coalition, SBU Metrasat can arrange the following activities: building a team consisting of five to seven people who could be the agents of change and selected based on the aforementioned criteria; and full, consistent, and continuous support from the top management that will assist the guiding coalition to implement those plans of change easier.

**Develop vision and strategy.** Changes without vision and strategy will make the plans useless and even dropped from the list of company’s activities. Furthermore, the stages of the process will become disorganized and no longer appropriate, so that the direction is chaotic or even stuck. Therefore, a clear vision will make it easier for employees to understand and perform the actions for changes. Currently, the vision of SBU Metrasat is to be “The Most Innovative & Admired Satellite Service Provider in the Region”. Based on the results of the analysis, the type of changes in the company is transition, so the vision is still relevant and it does not need to be revised. According to Sidorko (2008) and Saleh (2012), the 8-Step by Kotter (1996) can actually be implemented if the changes are transformational.

**Communicate the change vision.** Communication is a very important stage in the process of change in the company because it can reduce uncertainty and misunderstanding among related parties, so that it can give a positive response to the plans. Several stages below are expected to improve communication in SBU Metrasat to attain the success of change, as follows:

1. Having open communication with simple dictions and eliminating unrelated terms and jargons. Leaders can communicate to the employees thoroughly, not just making regular announcements.
2. Communication through visual media such as pictures or videos and animation, because visual media can explain things more lively and meaningfully.
3. Two-way communication or face-to-face is necessary, as in every major step in the process of change, there are clarification and feedback, thus employees understand how leaders take important decisions. At this stage, especially during change implementation, feedback becomes a very important early warning if the changes do not match expectations or are out of line.
4. Increasing participation and intensifying employee dialogue through online forums in email or group chat, and blasting information on the company’s website that aims to get a more positive response in communicating the changes.

Furthermore, there must be repetitions in delivering visions through the media and forums above. Regular and scheduled weekly meetings allow employees to be confident and more open during the transition process. Next, there will be internalization process in each employee, because an idea will be embedded into people when they have heard it many times and repeatedly.

**Empower broad-based action.** Usually in engaging employees during the changes, there are some major obstacles, namely related to structures, skills, systems, and supervisors. From the McKinsey’s 7S analysis, skill and structure of SBU Metrasat become the barrier factors of the company. SBU Metrasat must respond to the findings. Hence, the organization has to implement several actions below:

1. Making clear on the description, responsibility and accountability of the tasks based on the company structure that is changing in line with the strategic changes in the environment. It needs to assure the standard operating procedures or regulations as a means of control over all related units, and reduced the hierarchy.
2. Formulating necessary performance measurement based on key performance indicator (KPI) that is targeted by the company. The KPI is expected to help in the assessment of the effectiveness and efficiency of the main activities within the organization.
3. Rewards and recognition for the outstanding employees, to enhance the motivation, optimism, confidence and inspiration.
4. Conducting education or training to improve competence. Moreover, it needs to emphasize the need for training during the empowerment process, which can increase employee motivation in the program.
5. Mentoring and coaching to employees at SBU Metrasat to further widen their knowledge and experience as well as enriching their personalities.
6. Building a good relationship among employees or stakeholders in the company, thus there will be deeper emotional bonds that might provide positive impulses for the

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successful implementation of the company’s strategic changes.

Generate short-term wins. It is important to monitor the stages of change, as the strategic change management happens in a long period but have a large scale, so it is necessary to create short-term wins. A number of early yet small achievements can foster confidence and a belief that there would be greater success to attain that creates a momentum of change. These are useful in delighting the employees to celebrate small victories; yet for the management, the small victories guarantee that the changes are on the right track (Pietersen 2002).

According to Kotter (1996), there are three characteristics of small wins: first, small wins are visible and that the achievement or the results can be seen by ourself or by others; secondly, it is unambiguous as the results is clear and uncontested, and; thirdly, the achievement is closely related to the process of changes by the company.

The realization of the targeted short-term victory could eliminate the obstacles as the attempts to reinforce the vision of the changesto the employees. The top management of the company is recommended to give chances to celebrate and appreciate the effort of the team and all related parties in making the program successful.

Consolidate gains and produce more change. This stage aims to prevent early satisfaction and get rid of much bigger barriers. It is important for leaders to take advantage of this short term momentum to resolve further issues within the company. To consolidate the accomplishments and make more changes, the organization needs to do:

1. Delisting past works that are already irrelevant, then focusing on the the process of change.
2. Management team identifies dependence upon unnecessary things and gets rid of them that can eventually facilitate changes in the long term.
3. To engage more people in the process of change, the skills and functions of the lower level personnel should be developed. This can be through making project management or leadership programs for the lower level employees, and order them to manage and lead some small projects.
4. Top management must remain focus on advancing the company to keep hightsense of urgency while ensuring clarity of changes and long term vision.

Anchor new approaches in the corporate culture. The results of the analysis indicate the changes in the company belong to transition type, thus the company does not have to make any changes to the organizational culture as proposed by Anderson and Anderson (2001). According to Sidorko (2008), and Saleh (2012) the 8-Step of change process by Kotter (1996) can be implemented thoroughly for transformational companies. In this study, the eighth stages are not required to be done as a whole for the moment.

IV. CONCLUSION

SBU Metrasat is in a dynamic environment, and this situation urges the organization to make changes, which type of changes is transition. Analysis of the internal factors that drive companies are developing new products, marketing products to new segments, changing the mindset of organizations to customer oriented, strengthening the marketing and product development units, and assuring the position of leaders. Meanwhile, the external factors such as focus on the customers, the demand for high quality and fast services, speed in handling problems, and easy use of the services become the driving to conduct strategic change management.

In order to maintain its position as the market leader in satellite communication services industry, the company establishes three priority strategic change management. These strategies lead the company to make changes in the nine elements of the business model canvas. However, for achieving innovative value, the company should concern four elements, namely value proposition, key resources, key activities and key partners.

The model of McKinsey 7S, analysing the "S" elements of the organization is to identify the driving factor or the barrier factor. The results of the analysis indicate that elements of structure and skill are still lack and categorized as barrier factors of the organizational changes. To upgrade performance, the organization should be simplifying the process, interrelating the function between units and increasing control using the IT system.

Programs for change management at SBU Metrasat are referring to 8-Step by Kotter, but only 6 of 8 steps would be implemented by the company since the type of changes is transition. The planning of main programs and subprograms for the company is based on 8 phases of Kotter as a guidance and early warnings for the SBU Metrasat’s change management.

Suggestions

It is suggested for the next research to analyze the implementation of change management in a company by using the methods that can measure the levels of effectiveness and compliance to changes. Hence, they can determine the steps to successfully implement changes, and can find out the inhibiting factors in the implementation of such changes.

In addition, further research could analyze the strategic change management at other companies which experience more complex changes, or transformational changes. Those research are suggested to study the effectiveness of transformational changes compare to transitional change of this research.

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Selection of best Technical and Financial system for Resort in hilly region in the prospect of Vapor Compression and Absorption System

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Abstract
The existing vapour absorption system is compared with the vapour compression system designed with the detailed ASHRAE standard CLTD method along with software like e-solution. The pros and cons of the vapour compression system and vapour absorption system is compared in technical and financial reference. The research paper is based on the resort located in the hilly region projecting circumstances of modern rated star luxury facility. For calculated load of 60 TR, fuel consumption of boiler at different loading conditions is determined. Then actual and theoretical fuel consumptions are compared. For the analysis, existing VAS is replaced by the Variable Refrigerant Flow (VRF) system. Complete design of VRF system is performed separating the building in three zones: (a) upper two floor, (b) ground floor and (c) lobby. Energy consumption of VRF system is also calculated and compared with VAS. The research displays that load performance of VAS is poor and resort using VAS are losing large amount of fuel and associated financial resource at part load condition. When comparing VAS with VRF system, it is also found that large amount of money will be saved by replacement of VAS by VRF system with less payback period.

Index Terms-
CLTD- Cooling load temperature difference, VAS- vapor absorption system, VCS-vapor compression system, VRF- Variable refrigerant flow

Introduction
Even though air conditioning have jumped the great advancement in the technology with improvement in the cost and efficiency, the replacement of the older system with the newer always incudes the hectic work of risk in time and money frame. Due to such constraints, around 40-45% of hospitality and processing industry are operating the obsolete VAS due to lack of appropriate research work or study. The operation of VAS in processing industry is justifiable due to waste heat recovery but the operation of VAS system in resort hotel seems somewhat peculiar in terms of costly heat source. These hospitality industry are using the oil fired or some costly heat source to run VAS. VAS has to be operated in same rate irrespective of the load occupancy i.e. the burner/boiler takes the same amount of fuel and cost even at the variation of load. The part load performance curve of VAS and VCS also symbolizes it. So, to provide the concrete idea of VCS over VAS, retrofitting of the VRF system in the existing VAS is done with the cooling and heating load calculation.
Load Calculation

CLTD Method: This method is derived from Transfer function method and uses tabulated data to simplify the calculation process. The CLTD/CLF/SCL method is regarded as reasonable accurate approximation of heat gain through a building envelope. Error when using this method tends to be less than twenty percent over and less than ten percent under. However for strictly manual load calculation CLTD/CLF/SCL method is most practical method to use.

For cooling and heating load calculation, first of all area of rooms and lobby are calculated by measuring the dimensions of room and lobby. Overall heat transfer coefficient for wall materials is also calculated. Detailed calculation of cooling load is calculated using CLTD method. Since the calculation shows the peak hour of load is around the solar hour of 13:00 to 15:00, the load designation is based on these solar hour. The Tons of refrigeration or cooling load in solar hour 13:00 was 61.99 TR and for 15:00 was 59.99 TR whereas the heating load was 241.5 kW

Technical Analysis

The coefficient of performance of absorption chiller is high at half of the full load i.e. 50%. The chiller in our analysis is according to above calculated load of 60TR, double effect, and indirect fired absorption chiller.

Boiler Efficiency = \frac{Energy\ Output}{Energy\ input}

The type of boiler in our analysis is condensing boiler. The boiler efficiency at varying load condition is different. The boiler efficiency at part load is slightly higher than full load operation. The efficiency of
Combustion Efficiency = \frac{\text{Energy supplied to the boiler}}{\text{Fuel calorific value}}

For oil burner heating system, combustion efficiency = 80% (Biarnes, 2013)

Combustion efficiency is assumed to be constant at part load also.

In our calculation pipeline loss is taken as 10% (Jae-Ki Byun, 2012) of total energy.

Now VRF system is designed for the same system operated with the VAS. VRF system is designed by dividing the building into three different zones: (a) Upper two floor, (b) Ground floor and (c) Lobby. The piping network and designed capacity are done in e.solution with following results.
### Table 1: HVAC System Details

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Category</th>
<th>Zone A</th>
<th>Zone B</th>
<th>Zone C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Upper two floor</td>
<td>Groundfloor</td>
<td>Lobby</td>
</tr>
<tr>
<td>1</td>
<td>Branches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type 1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Type 2</td>
<td>7</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type 3</td>
<td>12</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type 4</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Indoorunit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CoolingCapacity (kW)</td>
<td>3.6</td>
<td>3.6</td>
<td>22.4 (3 nos)</td>
</tr>
<tr>
<td></td>
<td>HeatingCapacity (kW)</td>
<td>4</td>
<td>4</td>
<td>25 (3 nos)</td>
</tr>
<tr>
<td>3</td>
<td>OutdoorBranch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Type 1</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Outdoor Unit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CoolingCapacity (kW)</td>
<td>33.5,40 (1 each)</td>
<td>33.5,40 (1 each)</td>
<td>61.5</td>
</tr>
<tr>
<td></td>
<td>HeatingCapacity (kW)</td>
<td>37.5,45 (1 each)</td>
<td>37.5,45 (1 each)</td>
<td>69</td>
</tr>
<tr>
<td>5</td>
<td>Pipe</td>
<td>6.35 mm</td>
<td>85.8 m</td>
<td>85.8 m</td>
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<tr>
<td></td>
<td></td>
<td>9.52 mm</td>
<td>56.5 m</td>
<td>45.5 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12.7 mm</td>
<td>115.2 m</td>
<td>126.3 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15.88 mm</td>
<td>87.0 m</td>
<td>83.5 m</td>
</tr>
</tbody>
</table>
COP of vapor compression system remains approximately constant with load variation. The energy loss on the system is also low.

Thus from technical analysis energy saving through vapor compression system is more

Financial Analysis

Bill of Quantity (BOQ) is prepared for the new material required for VRF which shows the total amount of USD
119024.28.

We have considered followings:

Life of Project = 10 years  MARR = 15%

Calculated,

Internal rate of return= 58%
Payback period = 1.718 yrs

Conclusion

Unless and until energy is freely available, Variable Refrigerant Flow (VRF) System is more appropriate/economical than Vapor Absorption System (VAS). From the financial analysis for the replacement of Vapor absorption system by variable refrigerant flow system, it is clear the cost of replacement will be paid back in 1.718 years. Net Present Value of the project is highly positive which is greater than and the Internal Rate of Return is 58% which is very high as compared to the MARR of 15%. So, there is opportunity of high investor return in the project. Hence, the project is highly economically viable.

References


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Identification and Prevalence of Learning Disabled Students

Prof. Jitendra Kumar* and Ms. Singh Suman**

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**Ms. Suman Singh, Research scholar, Department of Education. MDU, Rohtak, Haryana.

Abstract- The objective of the study was to identify and know the prevalence of learning disability among children of class fifth. The sample comprised of all the students studying in class fifth of five schools in Kurukshetra and Jind districts of Harayana. The tools used were both formal and informal-Academic result of the previous class (English and mathematics), Checklist for identifying learning disabled students by teachers/parents, Ravens progressive matrices (test for intelligence) and Diagnostic test of Learning Disability (Swaroop and Mehta 2005). It was found that that the prevalence rate of students with learning disability varies from 10.76 percent to 13.41 percent with mean percentage of 12.31.

Index Terms- Learning disability

I. INTRODUCTION

E ducation is the instrument which brings about change in the social scenario and aids change and progress of self, thereby contributing to building a healthy nation. Proper care and education is the basic right of every child and a doorway to access other rights. Whereas ‘Education for all’ still remains a distant dream and for disabled, it is even more remote in India. Poor achievements in reading, comprehension and basic mathematical functions were and continue to be issues of concern for Indian primary education. These facts make it clear that the unsatisfactory level in children’s achievement could be due to the learning problems or learning difficulties (interchangeably used) faced by them. There are certain instances of poor performance in spite of average and above average intelligence, sufficient teaching-learning instruction and instructional materials, proper motivation and adequate home environment, social and cultural opportunity (Karande and Kulkarni, 2005).

A recent survey of the National Center for Promotion of Employment for Disabled People (NCPEDP), revealed that only 1.2 per cent of the disabled in India has had any form of education. In its effort to have an all India school level survey, NCPEDP found that from the 89 schools, 34 did not have a single disabled student and unfortunately, 18 of them having a policy against giving admission. Estimates range as high as 20% of the population, but recent reports to Congress on IDEA usually show that about 5% of school-age children and youths are receiving services under the SLD category. IDEA prevalence rates vary from state to state and even school to school. LD prevalence estimates vary as a result of how each state sets eligibility criteria and depending on the source of data (epidemiological, survey, child count, or research). Some of the variation in estimates may under represent prevalence; for example, data indicate that 15% of the population has dyslexia, which is only one of the disabilities served under LD, so it follows that the total prevalence of LD is greater than 15%. The identification of LD and determination of eligibility for services are two distinct concepts that influence reported prevalence rates. In India, the research conducted in learning disability has been primarily done over the last two decades and is today comparable with the research carried out in west nearly half a century ago.

Annual Status of Education Report (ASER), 2012 indicates that in std III 26.2%, in std IV 17.6% and in std V 12% of students only can read letters but not more. It means huge percentage of children in the education system in India is not able to read most basic level in their mother tongue. These facts suggest that the early diagnosis of learning disability in children is critically important to identify and suggest remedial solutions to the parents and children to understand about the learning disability as stumbling blocks such as lack of awareness, indifference and apathy and hamper success. Several studies have been conducted in India to determine the prevalence of learning disabilities in school children which has been reported to be 3-10 per cent among students population.

II. REVIEW OF RELATED LITERATURE

Mogasale, V.V., Patil, V.D., Patil, N.M. et al.(2012) conducted a cross-sectional multi-staged stratified randomized cluster sampling study to measure the prevalence of specific learning disabilities (SpLDs) such as dyslexia, dysgraphia and dyscalculia among primary school children in a South Indian city among children aged 8–11 years from third and fourth standard. A six level screening approach that commenced with identification of scholastic backwardness followed by stepwise exclusion of impaired vision and hearing, chronic medical conditions and subnormal intelligence was carried out among these children. In the final step, the remaining children were subjected to specific tests for reading, comprehension, writing and mathematical calculation. And found that the prevalence of specific learning disabilities was 15.17% in sampled children, whereas 12.5%, 11.2% and 10.5% had dysgraphia, dyslexia and dyscalculia respectively. This study suggests that the prevalence of SpLDs is at the higher side of previous estimations in India.

Arun, Chavan, etal.(2013) studied the prevalence of specific developmental disorder of scholastic skill in school students in Chandigarh, India to find out feasibility of screening tool in Chandigarh, India. A cross-sectional study on school
students was carried out in two phases. The students were drawn from classes VII to XII from 10 schools of Chandigarh, India. Details of academic performance of all the students was taken, subjectively from class teachers and objectively from the marks obtained in the last academic session. In phase I, 2402 students were assessed. In phase II, 108 students were randomly selected for evaluation for assessing sensitivity and specificity of screening proforma for teachers. A total of 124 students from phase I and all students in phase II were assessed in detail. Tests of intelligence (Malin's Intelligence Scale for Indian Children and Standard Progressive Matrices), and NIMHANS Index for specific learning disability (SLD) battery were administered. A total of 38 students were found to be having specific developmental disorder of scholastic skills in phase I, that gave a prevalence of 1.58 per cent. Majority had mixed type of errors on SLD battery. There were more boys diagnosed with specific learning disability.

Bansal,Sneh (2014) conducted a study with the objective to identify the children with learning disabilities in written expression studying at primary level. The sample comprised of 745 students in the age group of 8-10 years in third and fourth grade. The tools used were Teacher referral forms prepared by the investigator, Malin’s intelligence scale for Indian children (1969), Diagnostic test of learning disability by Swaroop and Mehta (2005) and test of written expression for grade III and IV prepared by the investigator. The findings of the present study revealed that 5.36% were found to have learning disability in written English, 4.28% and 6.32% in class III and IV respectively. The percentage of learning disability in girls and boys was found to be 3.98% and 5.9% respectively.

M Veena Kumari, Sayid M Barkiya (2016) conducted a cross-sectional study to identify learning disability in children with poor school performance and to analyze their clinical profile over a period of 1-year from July 2013 to June 2014 conducted at Kannur Medical College, Anjarakandy and rural areas of Kannur district in Kerala state, India, a total 300 students with poor school performance were selected by their class teacher. To the parents of these children, a questionnaire was given regarding birth history, development history, and questions regarding warning signs of learning disability. The students were later assessed. The study group included children in the age group of 8-12 years studying in third to seventh grade. Students with poor school performance were selected by their class teacher based on their academic and overall performance. Out of the 300 students with poor school performance, parental perception of learning problems was seen in 106 students. Post assessment 39 (13%) students had learning disability. Association was found between low birth weight, preterm birth, language, social and motor developmental delay. Association was also found between learning disability and attention deficit hyperactivity disorder.

Identification of students with learning disabilities

First the teachers were informed about the purpose and importance of the research. The academic results were taken into account and especially those children who were lagging in math’s and language subjects were considered. In the second stage the preliminary information was collected by administering the checklist for identifying learning disabled students. This test was administered on 386 students and in all 267 students was identified by the teachers as having learning difficulties. The students identified by the teachers and with poor academic performance were selected. The identified 267 students were administered to standard progressive matrices the intelligence test to find out the IQ scores of the students, as the learning disabled students generally have average or above average IQ. Out of 267 students 197 students with average or above average IQ were further administered the diagnostic test for learning disability and finally 42 students were selected as learning disabled student.

After administration of the test the following children were selected:

- Children who are referred by the teachers
- Children who scored below 45% in the previous class and an average range of intelligence (deviation IQ 85 or above) measured by Ravens progressive matrices.
- Children who had a composite score below 50 in DTLD.

III. Result

In this section the prevalence rate of learning disability among students is given. The researcher has adopted both formal and informal identification and diagnosis methods. The data pertaining to identification of learning disability is given in table 4.1.

<table>
<thead>
<tr>
<th>Phase</th>
<th>Identification tools</th>
<th>No. of students identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Checklist for identifying learning disabled students by teachers/parents.</td>
<td>386</td>
</tr>
</tbody>
</table>

Tools used

Multiple approaches were used for this purpose, which were as follows:

- Academic result of the previous class (English and mathematics).
- Checklist for identifying learning disabled students by teachers/parents.
- Ravens progressive matrices (test for intelligence)
- Diagnostic test of learning Disability (Swaroop and Mehta 2005).

Table 4.1

Identification of students with learning disability
It is observed from table 4.1 that for identifying students with learning disability in the first place.

### 4.2 Prevalence of students with learning disability

The table 4.2 reflects the prevalence of students with learning disability of class V studying in 5 different schools. The prevalence of students with learning disabilities is shown in terms of percentages. The table clearly indicates that the prevalence rate of students with learning disability varies from 10.76 percent to 13.41 percent with mean percentage of 12.31.

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the School</th>
<th>Number of students</th>
<th>Number of students with learning disability</th>
<th>Percentage of students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>School I</td>
<td>82</td>
<td>11</td>
<td>13.41</td>
</tr>
<tr>
<td>2</td>
<td>School II</td>
<td>68</td>
<td>8</td>
<td>11.76</td>
</tr>
<tr>
<td>3</td>
<td>School III</td>
<td>53</td>
<td>6</td>
<td>11.32</td>
</tr>
<tr>
<td>3</td>
<td>School III</td>
<td>73</td>
<td>10</td>
<td>13.69</td>
</tr>
<tr>
<td>4</td>
<td>School IV</td>
<td>65</td>
<td>7</td>
<td>10.76</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>341</td>
<td>42</td>
<td>12.31</td>
</tr>
</tbody>
</table>

### IV. CONCLUSION

During the past few decades, the understanding of learning disability has changed. However, it is a tremendous challenge to identify and diagnose and assist children with learning disability. Since no national census of the learning disabled has been taken in India, it is difficult to collect their actual number. In India, the learning disabled children are not identified using reliable tests. We do not have a clear idea about incidence and prevalence of learning disability in India. These facts suggest that the early diagnosis of learning disability in children is critically important to identify and suggest remedial solutions to the parents and children to understand about the learning disability as stumbling blocks such as lack of awareness, indifference and apathy and hamper success. If proper identification and diagnosis is done remediation can be provided at the right time, children with LD can and do learn successfully and become winners in the society later.

### REFERENCES


### AUTHORS

**First Author** – Prof. Jitendra Kumar, Prof. Jitender Kumar, Head, Department of Education. MD University, Rohtak, Haryana, India

**Second Author** – Ms. Singh Suman, Ms. Suman Singh, Research scholar, Department of Education. MDU, Rohtak, Haryana
Phytodiversity, Abundance and Importance of Some Useful Plants at Mangrove Swamp Forest of Sobekiri Rivers State Nigeria


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3 Department of Environmental Science, Egerton University, Njoro, Kenya
4 Department of Pure and Applied Chemistry, University of Calabar, Calabar, Cross River State, Nigeria.
5 Department Of Microbiology, Modibbo Adama University of Technology, Yola, Adamawa State, Nigeria.

Abstract- The mangrove swamp forest of Sobekiri I, II and III area of Rivers state Nigeria, was investigated to determine the phytodiversity, flora density, bundance, and importance of some useful plants including endangered species. three 250 x 40 transects containing (10 x 10) randomly laid quadrants for trees, 5 x 5 for shrubs and 1 x 1 for herbs was used in 1 hectare plot to transects containing (10 x 10) randomly laid quadrants for trees, increase the chances of encountering and inventorying all species. Phytosociological data were collected and used to determine diversity of the forest. Nineteen (19) plant species belonging to 12 families (8 trees, 4 shrubs and 6 herbs) were encountered which represent 78.20% trees, 14.3% shrubs and 7.5% herbs in the forest. The three most abundant families in descending order were Rhizophora mangle (red mangrove), Nypa palm, (mangrove palm), Avicennia germinans (black mangrove) for trees while Chrysobalanus orbicularis, Chromophaene odorantum, are for shrubs. Crotalaria retusa and Aspilia Africana herbs. Species density ranged from 30 species ha\(^{-1}\) in Terminalia odorantum, are for shrubs. Crotalaria retusa and Aspilia Africana herbs. Species density ranged from 30 species ha\(^{-1}\) in Terminalia catapa to 5,540 ha\(^{-1}\) in Rhizophora mangle. The least abundant plant species for trees are Elaeis guineensis, Terminalia catapa and Dalbergia escastophyllum while for shrubs are Urena lobata, and Manotes spp. Crograstic tremula and Musa spp is for herbs respectively. The Shannon index measured in a scale of 10 was 5.54 and evenness index measured in a scale of 1 is 1.62 for the habitat indicating moderate species diversity.

Index Terms- Phytodiversity, Flora, Mangrove Forest, Trees, Shrubs, Herbs

I. INTRODUCTION

Diversity provides an observer a feeling of satisfaction in the natural world (young and Swiacki, 2006). The species diverse mangrove swamp forest/fresh water swamp is one of the five (5) major types of vegetation in the forest zone of Nigeria. (NEST, 1991) the others are the coastal vegetation riparian forest and lowland rainforest.

Sobekiri I, II, III and environs of Andoni river lies between latitude 4°28’ to 4° 45’ and longitude 4°28’ and 4°45 East (Francis et al, 2007). It is one of the rivers that drain into river Niger. It is brackish water habitat. The area is made up of uplands such as red and white mangrove as well as Nypa Palms these make up the tropical rainforest of Sothen Nigeria. In the Niger Delta the mangrove swamp forest covers some 12000km\(^2\) or about half of the Delta (NDES, 1997) and one third of Rivers State. The forest is either partially or wholly flooded throughout the year (Agbagwa 2008). Mounds and ridges on the ground of this forest form numerous intricate narrow channels through which flood circulate on the forest floor. These channels also provide drainage network from the forest to surrounding rivers and streams. With the astronomical deforestation of the other forest zones in Nigeria even though some plants species are been endangered in the study area, the mangrove swamp forest/fresh water swamp forest remains the most extensive forest zone, due to largely swampy ground on which they exist hindered exploitation. However, the continued existence of this forest in the region is seriously threatened by the ingress of sea water through canalization to facilitate oil and gas activities (Agbagwa and Akpokodse, 2010).

The aims and objectives of this research work were investigated to determine the phytodiversity, flora density abundance, and importance of some useful plants including endangered/endemic species.

II. METHODOLOGY

2.1 The Study Area

The study was conducted in three (3) communities which includes. Sobekiri I, Sobekiri II, and Sobekiri III the communities share boundaries with the opobo creeks and some within the Bonny and Andoni River Which comprises of highly disturbed (HD) area, mildly disturbed (MD) area and undisturbed (UD) area for studying the status of species diversity, flora density/abundance, and medicinal/ importance of plant species.

2.2 Sampling:

The simple random sampling method (SRS) was used to conduct the vegetation studies along 3 transects within the study area and five (5) stations were sampled in each transect for evaluation of species diversity, flora density and abundance. A quadrant was randomly laid, from each quadrant sample species of trees, shrubs, and herbs were collected and identified to species level. For vegetation analysis of the site, the plot method of Devi and Yadava (2006) was adopted using (10x10m) for trees, (5x5m) for shrubs and (1x1m) for herbs. Oral interviews.
were taken in the dry field season of 2017, for medicinal and economic importance value of vegetation, protected area and conservation site. The collected data was entered into Microsoft Excel workbooks and evaluated using the programs analytical tools to compute the percentages (%) of the distribution of community vegetation structure and plant habits across the mangrove and natural swamp forest habitats.

2.3 Species diversity:
The natural and mangrove swamp forest habitat were analysed using Shannon Weiner and evenness index. This is a more valuable parameter since it takes into account the abundances of the censored species. It goes by the formulae. (Begon et al., 1986)

\[ H = \sum p_i \ln p_i \]

where \( H \) = Shannon’s index, \( p_i \) = log.

Following formula for evenness...

\[ EQ = -\frac{\sum p_i \ln p}{\ln S} \]

where

- \( EQ \) = equality
- \( S \) = total number of species

2.4 Quantitative Analysis:
The important quantitative analysis such as flora density and abundance of tree species, shrubs and herbs species were determined as per Curtis and Memtosh (1950).

III. FIELD RESULTS AND DISCUSSIONS

Geo referenced and pictorial evidence of Biodiversity sampled

<table>
<thead>
<tr>
<th>Location</th>
<th>Co Ordinates/Location ID</th>
<th>weather</th>
<th>Habitat Description</th>
<th>Photographs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sobekiri</td>
<td>E 7°13′53.968″ N 4°33′31.676″</td>
<td>Sunny/low tides</td>
<td>Mangrove swamp Forest</td>
<td><img src="image_url" alt="Photograph" /></td>
</tr>
<tr>
<td>Species</td>
<td>Common/Name</td>
<td>Family Name</td>
<td>Growth</td>
<td>2017 IUCN</td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------</td>
<td>-------------------</td>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>Rhizophora Mangle</td>
<td>Ngala/Red mangrove</td>
<td>Rhizophoraceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Rhizophora Racemosa</td>
<td>White mangrove</td>
<td>Rhizophoraceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Avicennia germinans</td>
<td>Laguncularia racemosa</td>
<td>Acanthaceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Nypa Palm</td>
<td>Udee or Mangrove palm</td>
<td>Arecaceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Chrysobalanus Orbicularis</td>
<td>Atabarka or Cocoplum</td>
<td>Rosaceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Urena lobata</td>
<td>Caesar weed or Congo Jute</td>
<td>Malvaceae</td>
<td>S</td>
<td>VU</td>
</tr>
<tr>
<td>Aspilia Africana</td>
<td>Bush Marigold</td>
<td>Compositae</td>
<td>H</td>
<td>VU</td>
</tr>
<tr>
<td>Crotalaria retusa</td>
<td>Devil- beam</td>
<td>Papilionaceae</td>
<td>H</td>
<td>VU</td>
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<tr>
<td>Terminalia Catappa</td>
<td>Sea-almond</td>
<td>Combretaceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Chromopaena Odorantum</td>
<td>Siam weed</td>
<td>Compositae</td>
<td>H</td>
<td>VU</td>
</tr>
<tr>
<td>Dalbergia ecosaphyllum</td>
<td>Roseweed</td>
<td>Fabaceae</td>
<td>T</td>
<td>VU</td>
</tr>
<tr>
<td>Inugotera Spicata</td>
<td>Mediterranean thyme</td>
<td>Papilionaceae</td>
<td>H</td>
<td>VU</td>
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</tbody>
</table>
The species diversity of the natural/mangrove swamp forest using Shannon Wiener index and evenness index the two indices used to evaluate species diversity for the habitat measuring in a maximum scale of 10 was 5.54 for the habitat indicating moderate species diversity. The evenness index on the other hand, measured in a maximum scale of 1 this informs on the relative distribution of the number of individuals (abundance) of each species. A value of 1.65 was calculated for the evenness index.

Figure 5: showing the most abundant species in the mangrove /natural swamp forest habitat in descending order.

<table>
<thead>
<tr>
<th>Flora</th>
<th>Species</th>
<th>Common Name</th>
<th>Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>Nypa Palm</td>
<td>Udee(mangrove palm)</td>
<td>6,475</td>
</tr>
<tr>
<td></td>
<td>Rhizophora Mangle</td>
<td>Red Mangrove (Ayaringa)</td>
<td>4,760</td>
</tr>
<tr>
<td></td>
<td>Avienia Africana</td>
<td>White Mangrove</td>
<td>1,170</td>
</tr>
<tr>
<td>Shrub</td>
<td>Chrysobalanus</td>
<td>Abarikal</td>
<td>1,860</td>
</tr>
<tr>
<td></td>
<td>Chromophana Odorantum</td>
<td>Siam weed</td>
<td>380</td>
</tr>
<tr>
<td>Herbs</td>
<td>Crotalaria retusa</td>
<td>Devil beans</td>
<td>375</td>
</tr>
<tr>
<td></td>
<td>Aspilia Africana</td>
<td>Bush marigold</td>
<td>314</td>
</tr>
</tbody>
</table>

Bar Chart
Table 5 most abundance species.

![Bar Chart Image]

Figure 6: Showing three (3) least abundant species of the mangrove / natural forest habitat.

<table>
<thead>
<tr>
<th>Flora</th>
<th>Species</th>
<th>Common Name</th>
<th>Least Abundance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees</td>
<td>Elaensis guineensis</td>
<td>Palm tree</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Terminalia catappa</td>
<td>Sea-Almond</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Dalbergia Ecostaphyllum</td>
<td>Rose wood 17</td>
<td></td>
</tr>
<tr>
<td>Shrub</td>
<td>Urena Lobata</td>
<td>Caesar wood(congo jute)</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Manotes Spp</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Herbs</td>
<td>Cragrois tremula</td>
<td>Love grass(cane grass)</td>
<td>48</td>
</tr>
</tbody>
</table>

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Table 6 Least abundance species.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Plant Habitat</th>
<th>No. of Plant Species</th>
<th>Percentage%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Trees</td>
<td>8</td>
<td>78.20</td>
</tr>
<tr>
<td>2.</td>
<td>Shrubs</td>
<td>4</td>
<td>14.3</td>
</tr>
<tr>
<td>3.</td>
<td>Herbs</td>
<td>7</td>
<td>7.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>19</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Communities Vegetation Structure and Species Growth Habit of Mangrove / Natural Swamp Forest Habitat of the Study Area:
The communities structures and growth habit of the habitat was evaluated using simple random sampling method (SRS). This concept indicates how the vegetation of the habitat is structured and the form in which species exist.

**Figure 6**: shows the flora (trees, herbs, shrubs) and the number of their families.
- Trees family: Rhizophoraceae, Acanthaceae, Arecaceae, Combretaceae, Fabaceae
- Shrubs family: Rosaceae, Malvaceae, Compositae, Comaraceae
- Herbs family: Papilionaceae, Cyperaceae, Gramineae, Musaceae

**Figure 7**: shows the distribution of community vegetation structure and plant habits across the mangrove and natural forest habitats. It also shows from the distribution that the vegetation in the study area is **homogenous**.
### Figure 8: Medicinal and Economic Importance of Species Censored In Study Area.

<table>
<thead>
<tr>
<th>Species</th>
<th>Medicinal and Economic Importance</th>
<th>No. of uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rhizophora mangle (Red mangrove)</td>
<td>Source of timber, making of fish traps, habitat for marine fishes</td>
<td>3</td>
</tr>
<tr>
<td>Rhizophora racemosa (White mangrove)</td>
<td>Fodder grass, use in fine texture, Lawns erosion control</td>
<td>3</td>
</tr>
<tr>
<td>Avicennia Africana (Black mangrove)</td>
<td>Treatment of ulcer, malaria, maturative poultice, use as aphrodisiac</td>
<td>3</td>
</tr>
<tr>
<td>Nypa Palm</td>
<td>Thatching, roofing houses, alcoholic beverages, Edible fruits, erosion control</td>
<td>5</td>
</tr>
<tr>
<td>Urena Lobata</td>
<td>Treatment of stomach-ache, diarrhoea, Dysentery, gonorrhoea, malaria, induce abortion</td>
<td>6</td>
</tr>
<tr>
<td>Terminalia catapa</td>
<td>Timber for roofing houses, boat building, Treatment of rheumatic joints</td>
<td>3</td>
</tr>
<tr>
<td>Cocos nucifera</td>
<td>Provision of food, making of fashion food, Caps, helmet, mats, brooms, brushes, rugs.</td>
<td>8</td>
</tr>
<tr>
<td>Aspilia Africana</td>
<td>Prevent conception and anti. Fertility, Control bleeding from fresh wounds</td>
<td>3</td>
</tr>
<tr>
<td>Chromophae ana odorantum</td>
<td>Improve soil fertility</td>
<td>1</td>
</tr>
<tr>
<td>Musa Spp</td>
<td>Fibres used for making ropes and mats</td>
<td>2</td>
</tr>
<tr>
<td>Elaesis guineensis</td>
<td>Making palm oil, soap, soap, kernel oil</td>
<td>4</td>
</tr>
<tr>
<td>Chrysobalanus orbicularis</td>
<td>Treatment of diarrhoea, dysentery, Source of oil from seed, treatment of Flaccid scrotum from by men.</td>
<td>4</td>
</tr>
<tr>
<td>Crotalaria retusa</td>
<td>Flowers and leaves sweet flavour and Edible as vegetable, treatment of cough, Treatment of fever, lung disease, treatment Of skin infection in children</td>
<td>5</td>
</tr>
<tr>
<td>Dalbergia Ecostaphyllum</td>
<td>Timber for roofing, firewood for cooking, Making woodwind musical instrument.</td>
<td>3</td>
</tr>
<tr>
<td>Inugotera Spicata</td>
<td>As incense placed on coffins during Funerals, purifications of room</td>
<td>2</td>
</tr>
<tr>
<td>Manotes Spp</td>
<td>Treatment of stomach-ache</td>
<td>1</td>
</tr>
<tr>
<td>Kyllingia erecta</td>
<td>Control soil erosion</td>
<td>1</td>
</tr>
<tr>
<td>Sporobulus pyramidalis</td>
<td>Straw mosaic, seed is edible for food</td>
<td>2</td>
</tr>
</tbody>
</table>
Cragrostis tremula
Livestock fodder, source of food,
Use in making traditional beads

IV. CONCLUSION
The tropical rainforest in Nigeria which is predominantly in the southern part of the country is threatened. The threat is worsened in the Niger Delta where the study area is located, by oil and gas exploration production activities which are the main source of income to the Nigerian nation. This study also observed that though these activities have been ongoing for long, the tropical rainforest and particularly the mangrove swamp forest of the area is still rich in floristic composition and diversity. However, there is no protected area or site of conservation, most of the forest has been affected by human activities as seen evidence of introduced/secondary species and the gradual reduction in the overall forest height is seen. There is, therefore need for further study of the area to determine measures for preservation of the biodiversity of the forest.

REFERENCES

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Survey of Angiosperm Parasites on Vegetation of Modibbo Adama University of Technology, Girei Local Government Area of Adamawa State, Nigeria


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Abstract- A survey of angiosperm parasites on vegetation of Modibbo Adama University of Technology Yola using quadrant method measuring 100m x 100m for 20 quadrant. A total number of (14) different types of host plants species were identified these include, Eucalyptus, Mangifera indica, Acacia seyel, Vittelaria paradoxa, Anacardium, Azadiracta indica, Pakia bigblobosa, Lycopersicum esculantum, ficus thoningi, Citrus sinensis, Helianthus annuus, vitex doniana, Afzelia AfricanaThe result shows that plants without parasites (angiosperm) are the dominant over those with parasites. Six (6) different parasites plants were also identified these are Loranthus, Mistletoes, Cuscuta, Oranbonche, striga, Cassytha. Mistletoes was found with the highest distribution attacking about five (5) different host species (Eucalyptus, Acacia seyel, pakia bigblobosa, Adansonia digitata, Afzelia Africana) making it the most dominant parasitic plant in the study area.

Index Terms- Angiosperm. Quadrant method, Host Plants, Parasites

I. INTRODUCTION

According to most recent tallies, there are 4100 species of angiosperm that are parasites on other plant species (Nickrent and Musselman 2004). In the angiosperm group, parasitism has evolved independently on a number of occasions, possibly up to 11 times (Burman et al. 2007), although it could be argued that this species is mycoheterotrophic as a true haustorium is not formed (Kopke et al. 1981). Parasitic angiosperm can be found throughout the world in most major ecosystems, from subarctic tundra, heartland and savanna woodlands to deserts and temperate and tropical forests. Some species are widespread agricultural pest; some are listed as rare and endangered while other species can enhance biological diversity (Norton and Carpenter 1998, Press and Phoenix 2005).

Two broad types of parasitic angiosperm are distributed globally those that parasitize stems (aerial parasites, 40% of species) and those that parasitize roots (root parasites, 60% of species), (Musselman and Press 1995). One exception is the genus Tripodanthus of which at least one species attached to both stems and roots of host (Amico et al. 2007, Mathiasen et al., 2008). Parasitic plants can be further distinguished according to whether they are xylem or phloem feeders (Raven 1983, Irving and Cameron 2009). Host plants of parasitic angiosperms are extraordinarily diverse and encompass much of the plant kingdom ranging from herbaceous annuals and perennials to trees and shrubs some parasitic plants can parasitize many different species (e.g 450 species in the case of vacuum album), while others are extremely host specific (Barney et al. 1998). A few parasitic partnerships have evolved so comprehensively that parasitic angiosperms can even parasitize other parasitic angiosperms epiparasitism and hyperparasitism, (Mathiasen et al. 2008). The role of parasitic angiosperms beyond that of immediate effects on host plants has been investigated most thoroughly in the past decade but mostly for herbaceous rather than woody hosts. (Press et al. 1999). Fungi, nematodes, bacteria and viruses are probably the first thing that comes to mind when thinking of plant parasites. These organisms certainly do cause damage to plants of economic importance. However, Parasites flowering plants are also important pathogens that cause damage to plants species (Daniel L. Nickrent and Lytton J. Musselman). Despite their huge importance and damage no detailed documentation of work has been carried on them. Although research have been conducted on the angiosperm parasites in other places but little or no work has been carried out on the angiosperm parasite species in Modibbo Adama University of Technology Yola campus.

This work will provide an overview of the type of parasites, identify the type of host that are been infected by a parasites and to determine the incidence of the angiosperm parasites. In order to achieve the stated objectives the study also has the following questions to provide answers. What is the type of angiosperm parasites found in the area? What is the percentage of plant species (host) with or without parasite?

II. MATERIAL AND METHODS

2.1 The Study Area:

The study was conducted at the Modibbo Adama University of Technology Yola campus. The area is situated in Girei in Local Government area of Adamawa state on latitude 09.14N and longitude 12.8N. The area has a landmass of about 50ha. (500.000m), it lies in the savanna region characterized by two distinct seasons (wet and dry) of varying durations. The
vegetation of the study area is characterized by few scattered trees dominating the herbaceous layer and the study was conducted on the undeveloped land mass only.

2.2 Sampling Method

Sampling via quadrant method was used as described by Slingsbly and Cook (1986). Quadrant was demarcated with pegs measuring 100m x 100m using a measuring tape. A total of 20 quadrants samples were randomized for data collection. Name of plant species and number of occurrences of species in each quadrant was recorded. Plant species were identified through leaves, stem, flowers and fruits which were then compared with the characteristic description of the plant species in text using vegetation of Nigeria, Keay (1989) and Shashina (1989). This also aided in the identification of the plants samples collected.

2.3 Data Computation:

For the computation of the data, the following formulae were used.

Mean Area per tree (MA) = \frac{\text{Plot Area}}{\text{Number of Vegetation}}

In the quadrant method, distances were not measured; the mean area was obtained by dividing the plot area by “sum numbers of trees in all plots.

Absolute Frequency (AF) = \frac{\text{Number with points species}}{\text{Total number of species}} \times 100

Relative Frequency (RF) = \frac{\text{Number with points species}}{\text{Total number of species}} \times 100

Relative frequency is the same or referred to as frequency percentage and it provides more useful information than the one derived on absolute basis.

III. RESULTS

3.1 Incidence of angiosperm parasites on vegetation.

The result on incidence of angiosperm parasites on vegetation of Modibbo Adama University of Technology Yola campus, fourteen (14) different plant species were identified and six (6) different parasitic plants (angiosperms) were identified from the twenty (20) sample quadrants (Table 1). The mean area per tree (MA) is 33.67m² and the mean distance (D) is 5.80m. This shows a sparse pattern of vegetation distribution of the plant species see (Table 2). The most frequently dominated parasitic plant and the highest distribution are mistletoes and cuscuta (Table 3).

The most common angiosperm parasites are mistletoes 28.5% and cuscuta 23.42% (Table 4). Host plants with parasites, vittelaria paradoxa have the highest distribution with absolute frequency and relative frequency of 70 and 23.56% respectively. This followed by Azadiracta indica with 60 and 20.20% (Table 5). Host plants without parasites, Azadiracta indica have the highest distribution with absolute frequency and relative frequency of 175 and 58.92% respectively. This followed by Eucalyptus with 125 and 42.08% (Table 6).

TABLE 1: Host plants with parasitic angiosperms found in Mautech April 2015

<table>
<thead>
<tr>
<th>Name of Plant species</th>
<th>Local Name</th>
<th>Name of parasitic plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vittelaria paradoxa</td>
<td>Shear butter</td>
<td>Loranthus</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>Zaiti</td>
<td>Mistletoes</td>
</tr>
<tr>
<td>Mangifera indica</td>
<td>Mango</td>
<td>Loranthus</td>
</tr>
<tr>
<td>Acacia seyal</td>
<td>Shitim wood</td>
<td>Mistletoes</td>
</tr>
<tr>
<td>Anacardium</td>
<td>Cashew</td>
<td>Cuscuta</td>
</tr>
<tr>
<td>Azadiracta indica</td>
<td>Neem tree</td>
<td>Cuscuta</td>
</tr>
<tr>
<td>Pakia biglobosa</td>
<td>African locust</td>
<td>Mistletoes</td>
</tr>
<tr>
<td>Adansonia digitata</td>
<td>Baobad</td>
<td>Cuscuta</td>
</tr>
<tr>
<td>Lycopersicum esculantum</td>
<td>Tomato</td>
<td>Orabanche</td>
</tr>
<tr>
<td>Ficus thonginii</td>
<td>Blume</td>
<td>Loranthus</td>
</tr>
<tr>
<td>Citrus sinensis</td>
<td>Orange</td>
<td>Cuscuta</td>
</tr>
<tr>
<td>Helianthus annuus</td>
<td>Sunflower</td>
<td>Striga</td>
</tr>
<tr>
<td>Vitex doniana</td>
<td>Black plum</td>
<td>Cassytha</td>
</tr>
<tr>
<td>Afzelia africana</td>
<td>African Oak</td>
<td>Mistletoes</td>
</tr>
</tbody>
</table>

The mean area per tree (MA) is 33.67m² and the mean distance (D) is 5.80m. This shows a sparse pattern of distribution of the plant species.

**Table 2: mean Area per Tree/ Mean Distance (plot area 10,000m²)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean area per tree (MA)</td>
<td>33.67m²</td>
</tr>
<tr>
<td>Mean distance (D)</td>
<td>5.80M</td>
</tr>
</tbody>
</table>
### Table 3: Distributions of Angiosperm parasites in Mautech

<table>
<thead>
<tr>
<th>Host species</th>
<th>Loranthus</th>
<th>Mistletoes</th>
<th>Cuscuta</th>
<th>Oranbonche</th>
<th>Striga</th>
<th>Cassytha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vittelaria paradoxa</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>#</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Mangifera indica</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Acacia seyal</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Anacardium</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Azadiracta indica</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Pakia biglobosa</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Adansonia digitata</td>
<td>#</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Lycopersicum esc</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>#</td>
</tr>
<tr>
<td>Ficus thoningi</td>
<td>#</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Citrus sinensis</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Helianthus annuus</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Vite doniana</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>#</td>
</tr>
<tr>
<td>Afzelia Africana</td>
<td>*</td>
<td>#</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
</tbody>
</table>

**Key:** #: present, *: Absent.

### Table 4: Percentage of Angiosperm parasites in Mautech

<table>
<thead>
<tr>
<th>Name of parasites</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loranthus</td>
<td>21.42</td>
</tr>
<tr>
<td>Mistletoes</td>
<td>35.71</td>
</tr>
<tr>
<td>Cuscuta</td>
<td>28.57</td>
</tr>
<tr>
<td>Oranbonche</td>
<td>7.14</td>
</tr>
<tr>
<td>Striga</td>
<td>7.14</td>
</tr>
<tr>
<td>Cassytha</td>
<td>14.28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Table 5: Absolute and Relative frequency of plant species with parasites

<table>
<thead>
<tr>
<th>Name of species</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vittelaria paradoxa</td>
<td>70</td>
<td>23.56</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>25</td>
<td>8.41</td>
</tr>
<tr>
<td>Mangifera indica</td>
<td>50</td>
<td>16.83</td>
</tr>
<tr>
<td>Acacia seyal</td>
<td>15</td>
<td>5.05</td>
</tr>
</tbody>
</table>

[www.ijsrp.org]
<table>
<thead>
<tr>
<th>Name of species</th>
<th>Absolute frequency</th>
<th>Relative frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vittelaria paradoxa</td>
<td>65</td>
<td>21.88</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>125</td>
<td>42.08</td>
</tr>
<tr>
<td>Mangifera indica</td>
<td>35</td>
<td>11.78</td>
</tr>
<tr>
<td>Acacia seyal</td>
<td>45</td>
<td>15.15</td>
</tr>
<tr>
<td>Anacardium</td>
<td>75</td>
<td>25.25</td>
</tr>
<tr>
<td>Azadiracta indica</td>
<td>175</td>
<td>58.92</td>
</tr>
<tr>
<td>Pakia biglobosa</td>
<td>40</td>
<td>13.46</td>
</tr>
<tr>
<td>Adansonia digitata</td>
<td>55</td>
<td>18.51</td>
</tr>
<tr>
<td>Lycopersicum esculentum</td>
<td>50</td>
<td>16.83</td>
</tr>
<tr>
<td>Ficus thoniging</td>
<td>10</td>
<td>3.36</td>
</tr>
<tr>
<td>Citrus sinensis</td>
<td>110</td>
<td>37.03</td>
</tr>
<tr>
<td>Helianthus annuus</td>
<td>30</td>
<td>10.10</td>
</tr>
<tr>
<td>Vitex doniana</td>
<td>20</td>
<td>6.73</td>
</tr>
<tr>
<td>Afzelia Africana</td>
<td>75</td>
<td>25.25</td>
</tr>
<tr>
<td>Total</td>
<td>835</td>
<td>281.08</td>
</tr>
</tbody>
</table>

### Table: 6 Absolute and Relative frequency of plant species without parasites

IV. DISCUSSION

From the survey on the incidence of angiosperm parasites on vegetation in the study area, 14 different host species were identified, and Vittelaria paradoxa was found to be the dominant 23.56 percent with two different parasitic plants (Loranthus and cassytha) despite the fact that it is being used as fodder, followed by Azadiracta indica 20.20 percent with parasitic plant (cuscuta) found on it.

Azadiracta indica 58.92 percent was found to be the dominant plant species without parasites, followed by Eucalyptus 42.08 percent. This shows that plant without parasites (angiosperm) are the dominant over those with parasites. The mean area per tree (MA) is 33.67m$^2$ and the mean distance (D) is 5.80m. This shows a sparse pattern of distribution of the plant species in the study area.

Mistletoes 35.71 percent was found with the highest distribution attacking about five (5) different host species (Eucalyptus, Accacia seyal, pakia biglobosa, Adansonia digitata, Afzelia Africana) making it the most dominant parasitic plant in the study area. This shows that Mistletoes have a broad host range. Mistletoes function as keystone resources in many ecosystems, and they are important ecological component that positively affect diversity of habitats (Watson 2001).

Followed by cuscuta 28.57 percent attacking four (4) different host plants (Anacardium, Azadiracta indica, Citrus sinensis, Adansonia digitata). Loranthus is another parasitic plant found attacking three(3) various host species, striga was found attacking two(2) different host species despite the fact that this is predominantly found during raining season, orabonche and cassytha both attacking different single host species.

The vegetation of the research field can be describe as “tree and shrubs this observation conjured with the finding of (kowal and kassan 1988) as a typical disturbed Sudan savanna region. The flora has profoundly modified by cultivation as evidenced by the presence of pakia biglobosa and Adansonia digitata which are associated with cultivation (Arnborg 1991).

V. CONCLUSION

It is evident that host plants of parasitic angiosperm are extraordinarily diverse and encompass much of the plant kingdom ranging from herbaceous annual and perennial to shrubs and trees. There are large number of parasitic angiosperms in the research field many parasitize woody plants, trees and shrubs can have plant parasites on both their stems and roots. These parasites rarely kill their host, but under most circumstances the host both woody and herbaceous species suffer reduced growth and reproductive performances. The relationship between host plant and parasitic plants vary widely. The general distribution of parasitic angiosperm is tightly linked with that of their host and dispersal agents.

In view of the above, effective protection and conservation strategy is to be put in place this will not only enhance host plant species but also guide against desertification and prevention of complete loss of the woody plants or plants generally present in the study area.
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Abstract - In Tanzania there are laid down land dispute settlement machineries which at all falls have legal backup. The rationale behind their establishment is to the effect that anyone who claims an interest over land has to knock the doors of the judicial holy temples for the redress. There is no dispute that land disputes at a village level are in existence despite having these machineries. However, this paper focuses on whether inaccessibility to these land dispute settlement machineries may be one of the sources for accelerated land disputes in Morogoro Region. Without prejudice to the above, this paper has examined the conflict theory in relation to the legal frame work in Tanzanian context. In so doing, laws applicable in Tanzania in respect to land matters particularly those vesting land dispute settlement machineries with force and validity have been examined. Notwithstanding the above, land dispute settlement machineries have been discussed in terms of establishment, composition, operation and sometimes their link in the course of administering justice in the context of quasi judicial bodies (particularly Tribunals) and the judicial bodies (particularly the High Court of Tanzania and the Court of Appeal of Tanzania) as land disputed machineries with exclusive powers to do justice over land disputes. Based on this position, this paper intends to discuss on what laws govern land matters in Mainland Tanzania, machineries vested with powers to settle land disputes and whether they are accessible enough to warrant a right quasi judicial operation vested to the underlying machineries. The focus is in Morogoro Region.

II. THEORETICAL AND LEGAL FRAMEWORK ON LAND Dispute SETTLEMENT IN TANZANIA

2.1 The Conflict Theory

The concept of land disputes worldwide is not new. It is linked with a conflict theory propagated by Karl-Max, a German Scholar and a revolutionalist by 1818 to 1883 who among other things, came with an assumption that economic organization, especially the ownership of property, determines the organization of the rest of a society. He was of the view that struggle for ownership of the scarce resources through class structure inherent in the economic organization is likely to create revolutionary class conflicts. It is from the above assumptions that through bipolar of the exploited class awareness of their true interests is gained thus form an organization to overturn the dominant class property holding class. That is to say, the cornerstone of the conflict theory is all about distribution of the scarce resources including property ownership and power. To be more precise, in Tanzanian jurisprudence, the term property includes land. This position was also shared in Tanzania, in the

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In Tanzania it is declaring the rights of each party to the controversy, either on ownership or any related interest to the property. In Tanzania it is well confirmed that the categories of land disputes at a village level involve villagers amongst themselves, villagers against the ownership or any related interest to the property. This means existence of land disputes at a village level is not in dispute. The issue at hand is whether the inaccessibility of the set legal machineries is one of the causes for the persisting land conflicts at a village level.

2.2 The Laws Governing Village Land Ownership and Land Dispute Settlement

Land at a village level in Tanzania has multiple laws governing it from the time an individual, a group of people, organization or the government acquires it to the time it is used for the best interest of the occupier or sometimes when it is transferred to another interested party as the case may be. The legal regimes guarantee an individual or any interested party over land with both substantive and procedural rights over land in the course of acquiring, using and even when transferring or assigning that right to another party. The legal framework imposes duties, procedures and rights to such a party who is either in occupation, usage or intends to transfer or assign the right one has over land. The same proposition applies to the village land in Mainland Tanzania. Various laws have been imposed to serve the purpose at a village level. These include the grand norm, Parent Acts, Subsidiary regulations. Policies have been included here though they possess no legal force, save when they are incorporated into the legal instrument as it is to the part of the Land Policy of 1995 within the Village Land Act and the Land Act.

The legal regimes move further to protect land rights of an interested party by setting down legal procedures where such rights over land are in conflict to each other or when it is the parties themselves who are in conflict over the village land. These laws are explained herein below.

2.2.1 The Constitution of the United Republic of Tanzania: 6

This is a mother law in Tanzania which guarantees every citizen with the right to own property. The right to own property is very old. Various philosophers have digested about it. Aristotle contended that the abolition of private property will mean that no man will be seen to be liberal and no man will ever do any act liberally, for it is in the use of articles of property that liberty is practiced. 7 John Locke as well, puts it clearly that no man could ever have power over the life of another by right of property in land or possessions since it would always be sin in any man of estate to let his brother perish for want of affording him relief out of his plenty; for justice gives every man a title to the product of his honest industry and the fair acquisitions of his ancestors descended to him, so charity gives every man a title to so much out of another’s plenty as will keep him from extreme want, where he has no means to subsist otherwise. 8

The Constitution of the land has not been far from the concepts above as it guarantees the right to the citizens to own property which includes land. 9 It gives this right to own property and protects it in case this right is taken away from him. The Constitution provides two items over this right: that is the right to own property and the second item is the conditions on how that right can extinguished from an interested party. The latter provides for existence of the law which extinguishes that right and sets out a mandatory requirement for payment of prompt and fair compensation. 10 The absence of the enshrined conditions entails the entire proceedings over this right a nullity. There is a litany of case laws supporting this proposition. 11 That being the case as per Aristotle’s contention that if one is prohibited to own land as if his liberty is curtailed, likewise the Constitution guarantees every citizen to own property anywhere in Mainland Tanzania provided one complies to the laws. It is the same grandnorm that guarantees a duty to do justice to the Courts of law, 12 vested with such mandate in the course of resolving the said disputes.

2.2.2. The Land Act: 13

The majority would erroneously think that this law does not have any application over the Village Land. Its application is of such vital role to the village land to an extent of declaring it supreme to the Village Land Act in case of any inconsistencies or conflict to the law. 14 It is this law that maintains the notion that all land in Tanzania is a public land and is entrusted to the President as a trustee. 15 This notion takes precedence to the village land. It is this law that gives the general categories of land

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4 Attorney General Vs Lohay Akonaay and Joseph Lohay (1995) TRL 80 (CAT)
5 Speech of the Minister for Lands, Housing and Settlement Development issued in June 2015 before the National Assembly when debating on the Annual Budget of 2015/2016, pp. 26 and 27; See also Speech of the Minister for Lands, Housing and Settlement Development issued in June 2016 before the National Assembly when debating on the Annual Budget, 2016/2017 pp. 73
6 Cap. 2 R.E 2002
9 See Article 24 of Cap. 2 R.E 2002.
10 See Article 24(2) supra
11 See the case of Attorney General v. Lohay Akonaay and Joseph Lohay (1995) TLR 80 (CA),
12 See Article 107A of Cap. 2 R.E 2002
13 Cap. 113 R.E 2002
14 See Section 181 ibid.
15 See Section 4(1) ibid.
in Mainland Tanzania as a general land, village land and reserved land. There is also a link on the underlying procedures upon which the transfer land is dealt with, either from the village to general land or reserved or the vice versa. There are instances where the village land legal systems apply mutatis mutandis with what is applied in this law. As if it is not enough, the law provides that in case of contradiction as regards all matters of land in respect to laws applicable to the subject matter the Land Act stands to prevail. It is loudly provided that the Land Act shall apply to all land in Mainland Tanzania and any provisions of any other written law applicable to land which conflict or are inconsistent with any of the provisions of the Land Act, to the extent of the conflict or inconsistence, shall cease to be applicable to land or any matter connected to with land in Mainland Tanzania.

Furthermore, the Land Act is applicable over the village land where there is a dispute on boundaries and the Minister is bound to appoint an Inquiry. The procedures to be applied are obtained from the Land Act under Section 18 of the Land Act. It is worthy emphasizing here that the Land Act therefore applies to the village land to the extent the Land Act provides thereto and the extent that any other law conflicts with it.

2.2.3. The Land Acquisition Act:

The President being a trustee of land in Mainland Tanzania is entitled to acquire land anywhere in Tanzania for public purpose. The term public purpose connotes any of the following instance: exclusive Government use, for general public use, for any Government scheme, for the development of agricultural land or for the provision of sites for industrial, agricultural or commercial development, social services or housing; anything connected with sanitary improvement of any kind, including reclamations; anything connected with the laying out of any new city, municipality, township or minor settlement or the extension or improvement of any existing city, municipality, township or minor settlement; connection with the development of any airfield, port or harbour; connection with mining for minerals or oil; for use by any person or group of persons who, in the opinion of the President, should be granted such land for agricultural development.

The president when so empowered to acquire land, he is guided by various principles which include but not limited to public interest, public utility or the interest of public economy. This therefore requires an approval by the National Assembly and the notice to issue thereto to the government gazette for protecting the interest of either party to the land.

In Tanzanian jurisprudence, it is not a new phenomenon as it is dully guided in our land Acts. For example: Section 4(1) and (2), the President may acquire village to a transfer land on the basis of public interest. The Land Acquisition Act sets a mandatory requirement of notice to the affected parties and a requirement of prompt and fair compensation for unexhausted improvements.

2.2.4. The Village Land Act:

This is the Parent Act which governs village land administration and village land management in detail. It covers various aspects such as important definitions and keys terms which apply within the village land. It also comprised of the fundamental principles of the National Land Policy. It covers on the other hand the discretionary powers of the President as a trustee of all land in Mainland Tanzania over the village land. It avails the President with such wide powers to an extent that the President can transfer the village land when he is minded so to do for public interest. This Act elaborates what exactly should fall within the ambit of the village land which this law stands to protect. This means it highlights the parameters within which the village land falls. The bodies which are vested with powers to manage and administer the village land are dully established and their underlying obligations thereto. The categories of village land are shown and its this law which shows the land rights in the village and how they are registered to the relevant authorities. These are commonly known as the attributes of customary right of occupancy. Similarly it highlights the right person with whom such land rights are vested to. These are mentioned to include, the villagers who are citizens and residents within the village, the Non-villagers though citizens but not residents at the material time but have prospects of being residents, non-village organizations and non citizens. The law shows clearly on how each party may have vested interest over the village land. It goes further to highlight adjudication of interest in village land and its underlying procedures. The law anticipated that in the presence of any vested interest over land there must be disputes which shall require a mechanism to resolve them. This is not different from what Fimbo (2004) once said that historically land has always been an arena of struggle between the contending forces. So the Parliament anticipating this has enacted provisions for covering this aspect in details. Lastly the law

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16 See Section 4(4) ibid  
17 See Section 5 ibid  
18 See Section 31(4), 57(4), 58(2), 58(3), 18 ibid  
19 See Section 181 supra  
20 Cap. 118 R.E 2002  
21 See Section 4(1) of Cap. 118 R.E 2002  
22 See the Case of Said Juma Shekimweri Vs AG, Misc. Civil Case No. 3 of 1996 High Court of Tanzania at DSM (unreported) , Bp Bhatt and Another Vs Habib Versi Rajan (1958) E.A 536, See also Agro Industries Vs AG (1994) T.L.R 43; Patman Garments Industries Ltd v Tanzania Manufacturers [1981] TLR 303., which discusses on the controversy of the term public interest.

23 Cap. 114 R.E 2002  
24 See Section 6, 7 and 11 loc. cit. fn. 21  
25 Cap. 114 R.E 2002  
26 See Section 2 ibid  
27 See Section 3 ibid  
28 See Section 4(1) of the Village Land Act, Cap. 114 R.E 2002  
29 See Section 7 ibid.  
30 See Section 8 supra  
31 See L.A. Willy, (2003), ‘Community-based land tenure management, Question and Answers about Tanzania’s Village Land Act, 1999’ A Paper issued by the International Institute for Environment and Development, Drylands Programme, Issue No.120 of 2003 p. 34; See also Ss. 12, 18, 19,27 and 29 of Cap. 114 R.E 2002  
32 See Section 48 to 59  
34 See Sections 60-63 of Cap. 114 R.E 2002  

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covers for miscellaneous provisions with penal offences and the
discretionary powers of the Ministers to issue regulations thereto.
It is the Village Land Act which has imputed in its provisions
other laws which may apply at a village level including the
Forest Act, National Parks Act, Ngorongoro Conservation Act,
Wildlife Conservation Act, Marine Parks and Reserves Act, High
Way Act, Public Recreation Grounds Act and the Land
Acquisition Act. The villagers are vested with powers to
declare part of their village area to fall into the demand of these
laws.

2.2.5. The Local Government (District Authorities) Act: 36

This is a very important law which enables the village
governments to govern and makes by-laws in relation to land
ownership. This is to say the law establishes village authorities
which are vested with powers to administer and or manage the
village land in Mainland Tanzania. It provides for the
composition of the village authorities and the meetings of the
village government as well the bindingness of the issued
decisions thereof.

2.2.6. The Land Use Planning Act: 37

This Act repeals Cap. 116 R. E 2002. It establishes the
procedures for the preparation, administration and enforcement
of land use plans. It is crucial in the execution of land use plans
countrywide. The law aims at improving local access to land
and control of its natural resources. It employs a participatory
approach where villagers themselves stand to reduce land
conflicts by themselves within their boundaries between the land
users. It assists the villagers to improve security of tenure by
certification of village land. It employs the Village Council as a
planning authority. It is this Act which puts in force various
strategies such as The Property and Business Formalization
Programme (commonly known as MKURABITA). Through this
programme, the certificates of customary rights are issued
through systematic adjudication approach. Through this
experience in Mvomero District, Morogoro Region, the District
Participatory Land Use Management team and the Village Land
Use Management Committee, six villages have been taken as a
pilot study. Similarly under the National Strategy for Growth
and Reduction of Poverty (commonly known as MKUKUTA II)
with its five years Plan from 2011/2012-2015/2016 identifies the
limited access to secure land rights as one of the crucial
constraints to Tanzania’s accelerated growth and development.41

Other projects of the like include Public-Private Partnership,
Kilimo Kwanza (2013), Big Results Now (2013/2014) and
decentralization by devolution (1990). This is one of the instances where the law applies.

2.2.7. The Land Disputes Courts Act: 43

It is a very important law which sets out the procedures for
the formation and operation of the land dispute settlement
machineries. These machineries include the Village Land
Council, the Ward Tribunal, the District Land and Housing
Tribunal, the High Court of Tanzania (Land Division) and the
Court of Appeal of Tanzania. It has been established that
Mainland Tanzania has established almost 49 District Land and
Housing Tribunals and it is only 42 tribunals which were in
operation. It was established that out of 19,879 cases that were
filed in these tribunals only 9,831 cases were settled. The
current status as it was issued in June 2015, shows that there only
47 District Land and Housing Tribunal which are in operation so
far after five tribunal were placed to operate that is Mbanda,
Kyela, Ngara, Karagwe and Ngorongoro. The total number of
13,338 cases were filed making a total of 31,782 cases are
pending in these tribunal whereas only 13,749 cases were
concluded leaving 18,033 pending in these tribunals. The most
recent Government Notice has pronounced other 47 District Land
and Housing Tribunals though not in operation yet. The
law sets out the procedure on how to enforce land rights in
case of disputes. The establishment of these tribunals is in
compliance to the Report of the Presidential Commission of
Inquiry on Land Matters which proposed among other things that
there should be some kind of an independent, impartial body
specially for resolving land disputes.

2.2.8. The Village Land Regulations 2001: 50

These are made under Section 65 of the Village Land Act
where the Minister is empowered to make regulations generally

35 Section 6 (1) of Cap. 287 R.E 2002
36 Cap. 287 R.E 2002
37 Act No. 6 of 2007
38 The United Republic of Tanzania: Strategic Plan for
Implementation of Land Laws (SPILL), 30th Version issued on
30th January 2014 by the Ministry of Lands, Housing and Human
Settlement Development p. 10
39 G. Mango and D.Kalekezi, (2011), The Study to Develop a
Strategy for Establishing Cost Effective Land Use Plans in Iringa
and Njombe Regions: A Report funded by the United Land Use
Planning Commission of the United Republic of Tanzania p.10
40 Supra p. 22
41 The United Republic of Tanzania: Strategic Plan for
Implementation of Land Laws (SPILL), 30th Version issued on
30th January 2014 by the Ministry of Lands, Housing and Human
Settlement Development pp.13-15
42 Ibid p.14-16
43 Act No. 2 of 2002 as it was rectified by the Government
Notice No. 225 of 8/8/2003: Entitled Rectification of
For more clarification see the case of Lweshabura
Mzinja Vs Juliet Jacob, Misc. Land Appeal No. 7 of 2005,
High Court of Tanzania (Land Division – as it then
was) at Dar Es Salaam, p.3
44 See the United Republic of Tanzania, Budget Speech,
2014/2015 Financial Year, Dodoma, Ministry of
Lands, Housing and Settlement, 2014.
45 See the United Republic of Tanzania, Budget Speech,
2013/2014 Financial Year, Dodoma, Ministry of
Lands, Housing and Settlement, 2013
46 See the United Republic of Tanzania, Budget Speech,
2015/2016 Financial Year, Dodoma, Ministry of
Lands, Housing and Settlement, 2015 p. 45.
47 See the United Republic of Tanzania, Budget Speech,
2015/2016 Financial Year, Dodoma, Ministry of
Lands, Housing and Settlement, 2015 p. 45.
48 See The Government Notice No. 545 of 2016
49 See RPCILM p. 105
50 Government Notice No. 86 of 2001 published on 04/05/2001

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for the better carrying out into effect the purposes of the parent Act. It contains the forms from Village Land form No. 1 to 49. It contains the procedures for village land adjudication committee as it is seen on Part VI of the Regulations. It highlights the procedures for compensation claims as it seen on Part III to the regulations and the issue of joint village land use agreement.

III. LAND DISPUTE SETTLEMENT MACHINERIES IN MAINLAND TANZANIA

Land disputes have been in place due to various circumstances which have now been the determinant of the mechanism to be employed to settle a particular dispute in Tanzania. These have included boundaries over the village land, issues emanating from land adjudication in the course of granting a certificate of customary right, or in any matter which the parties deem a controversy over land which may include any other interest over the village land. It is the nature of the dispute which determines what mechanism can be employed to resolve the land matter at hand. For the purpose of this study, the mechanism of land dispute settlement at village level is categorized into two parts: Judicial and Non Judicial mechanisms of dispute settlement. The former is so named on a reason that the parties to the dispute are bound to undergo ordinary court processes as to sue any other party of whose decision aggrieves his interests, while the latter is an administrative procedure which is not final and conclusive to the matter in dispute and does not involve litigation before the Courts of law or quasi judicial bodies as the case may be.

i. Non-Judicial Mechanism:
   a) Mediation through the Mediator
      Appointed by the Minister

   This is established where there is a dispute between the village using the village land with a person or body which is in occupancy with the land or boundaries demarcated as village land before the Village Land was in force or the village is in dispute over the village land occupied under a granted right of occupancy, occupied as a general land, occupied by another village land, or is occupied as a reserved land or is declared an urban area. Where there is such a dispute over the village land, the Minister responsible for lands may appoint a mediator whose role is to persuade the parties to reach a compromise over the boundaries. In case this comes out successful, then the dispute stands concluded as per the agreement. In case the matter is not resolved then the second approach is resorted to as an inquiry.

   b) An Inquiry:

   This is categorized into two parts: The first category of Inquiry: This takes place where the Mediator under Section 7(2) (a) of the Village Land Act, has failed to mediate the parties on the matter in dispute. The Minister therefore appoints an Inquiry upon receiving the report on mediation failure. In this case the Minister is bound to comply to Section 18 of the Village Land Act and the Minister may appoint one or two persons to hold an inquiry. When the Minister deems it just depending on the nature and seriousness of the matter may appoint a Judge of the High Court of Tanzania to hold such an inquiry. The advice on what judge should hold an inquiry is given by the Chief Justice of Tanzania whose advice binds the Minister as regards the appointment.

   The inquiry shall be held at any time, (with terms of reference from the Minister), within a month from the date of appointment and at any venue within the discretion of the Minister. It is set that the inquiry shall be open to the public save when the chairperson to the inquiry deems otherwise for the interest of the evidence to be provided. Each party to the inquiry shall be represented and the inquiry shall make sure each party is substantively heard.

   The procedures of conducting the inquiry are left to the discretion of the person chairing the inquiry. The principles guiding the proceedings shall base on the rules of natural justice. In this case, the person holding the inquiry has powers like that of the Judge of the High Court, witnesses are summoned, production of documents is required, and witnesses are examined under oath.

   The authenticity of the proceedings under the inquiry take precedence against any person as it is to judicial proceedings. The instances like perjury, subordination of perjury, false statements by interpreters, fabricating evidence, false swearing, deceiving witness, destroying evidence, conspiracy to defeat justice and interference with witnesses with justice, contempt in the course of conducting the proceedings and preventing or obstructing the service or the execution of the process are treated at the inquiry as it is done under ordinary court proceedings.

   The next step under inquiry is report preparing as to the outcome of the inquiry. The report is submitted to the Minister for Lands. It contains advice and recommendations as per terms of reference directing what interested parties to the dispute must abide to.

   The last step shall be publishing the report of the Inquiry. In order to exonerate the publishing authority from liability, the report is protected under the defence of qualified privilege. The rationale being protecting any acts or omission from the report of which any statement from it was done with good faith and that the publishing authority has some legal, moral or social duty to publish it, provided that the publication does not exceed either in extent or matter what is reasonably sufficient for the occasion. It is interesting to note here, that, the term public interest is in place again, availing the second chance opportunity to the

51 See Section 7(2) of the Village Land Act
52 See Section 48 ibid
53 See Section 62 ibid
54 See Section 8(12) ibid
55 See Section 7(2) ibid
56 See Section 7(2) (b) and Section 8(8) (d) of the Village Land Act, Cap. 114 R.E 2002
57 See Section 18(2) of the Land Act Cap. 113 R.E 2002
58 See Section 18(4) ibid
59 See Article 13(6)(a) of Cap. 2 R.E 2002
60 See Section 18(8) of the Land Act and Sections 102 to 110, 114 and 114A of the Penal Code Cap. 16 R.E 2002
61 See Section 18(9) of the Land Act, Cap. 113 R.E 2002
62 See Section 43(a) of the News Paper Act, Cap. 229 R.E 2002
63 See Section 8(10) of the Land Act, Cap. 113 R.E 2002
Minister not to accept the recommendation or the advice of the Inquiry in the matter in dispute. 64 The law does not define what that public interest is needed to be protected by the Minister in this sense.

The Second Category of Inquiry is made under Section 8(8)(d) of the Village Land Act. This happens where there is a dispute between the Village Council and Village Assembly or the dispute between the Village Council and the villagers who do not form a minimum of one hundred villagers. The gist of the dispute must be the allegations by the villagers or the village assembly as above mentioned to the effect that the village council is not exercising the functions of managing the village land as per the Village Land Act.

The other reason that may be advanced as an allegation to the village council warranting an inquiry is that it does not operate as per principles governing the trustee in the course of managing the village land. 65 The principles governing the trustee are well established under the law. 66 These include but not limited to any evidence that there is fraud and dishonesty by the Village Council or if it is adjudged bankrupt under any written law or enters into any agreement or scheme of composition with his creditors, or takes advantage of any law for the benefit of his debtors. 67 On the other hand, if it happens that the Registrar-General has decided to exercise his duty of investigating the trustee for use or misuse of any property vested in the trustee. The Registrar-General may investigate or authorize any fit and proper person to investigate on his behalf into the trustee. All these circumstances prove that the trustee who in this case, the Village Council, is against the principles of trusteeship.

Last, the inquiry may be conducted if there is an allegation from the Village Assembly or at least one hundred villagers that the village council is against any other laws operating over the village land in Mainland Tanzania.

Under these circumstances, the District Council after having received the complaints may recommend to the Commissioner for Lands that the inquiry be appointed under section 18 of the Land Act, to investigate the complaint and make recommendation. The procedures under category one of the inquiry applies in this case as well. 68

The inquiry may recommend to the Minister for Lands that the management of the village land be removed from the jurisdiction of the village council subject of inquiry either for a fixed term or an intermediate period and transferred to either the district council in the area where whose village council is being inquired or the Commissioner.

After the Inquiry has completed the investigation, with the results that the village council is at fault, the Commissioner shall take all such actions to re-establish the lawful management of that village land and proper allocation of the interests in that village land. This process is with such hurdles as if the Commissioner is an allocating authority or appointing authority of the village council at the village level.

c) Land Adjudication Committee

This is the body that deals with village land adjudication particularly where there is a need for demarcation to the village land before obtaining the certificate of customary right of occupancy. Where it is established that the need so arises and upon approval by the village assembly, a village land adjudication committee may be established of whose members are elected by the Village Assembly. The Committee consists of not less than six and not more than nine persons whom three of them should be women. 69 The tenure is three years time renewable for another term. The Chairperson of the Committee is appointed by the members of the committee amongst themselves. The quorum for the purpose of issuing a decision must be of four if the members are six of which half of the members shall be women and it is more than six but not exceeding nine, at least five members shall constitute a quorum of which two of them shall be women. As to control the proceedings, in case of any equal votes during decision making process, the Chairperson shall have a casting vote as well as an original vote and shall be vested with power to administer oaths and issues summons, notice order for attendance of any person as it may be necessary at the proceeding.

The Committee shall have the executive officer who is also termed as the village adjudication adviser. 70 It is this officer who keeps the records of the committee. The committee for that matter is vested with jurisdiction over all claims made during adjudication process and it is empowered to conduct a hearing by determining its own procedures after a notice has been issued and published in prominent places in the village. 71 The rationale for the notice is to specify the adjudication area, to require any interested person to forward his claims and requiring any interested person to specify his boundaries within the adjudication area.

In the course of hearing, the Committee is governed by various principles. These include rules of natural justice. 72 That being the case, the Committee is endowed to hear evidence which would not have been admissible in a court of law, call evidence of its own motion, use evidence contained in any official record or adduced in any other claim.

The Committee at a hearing is vested with power to mediate the parties through amicable settlement over the disputed land. After going through the proceedings the Committee is obliged to issue provisional adjudication records. 73 In case no appeal is preferred, the record shall be final and binding upon all the parties. The said record must be entered into the village register.

The adjudication committee determines the boundaries of the village land in interest for adjudication purpose, set aside or makes reservation to the rights of easement, issues any decision

64 See Section 7(5) of the Village Land Act, Cap. 114 R.E 2002
65 See Section 8(2) Supra
66 See Section 4 and 14 of the Trustees’ Incorporation Act, Cap. 318 R.E 2002
67 See Section 4.
68 See Section 18 of the Land Act, Cap. 113 R.E 2002
69 See Section 53(1) and (2) of the Village Land Act
70 See Section 52(1) and 53(8) supra.
71 See the Village Land Regulations 2001-Village Land Form No. 46
72 See Section 53(9) ibid. See also the concept of natural justice from E.G.Mushi, (2014), Administartive Law of Tanzania, 1st Ed. Mzumbe University, Morogoro, pp.242 to 283
73 See The Village Land Regulations, 2001 -Village Land Form No. 49; See also Section 54(6) of the Land Act, Cap. 114 R.E 2002

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relating to customary law subject to village adjudication, advice the village adjudication adviser and safe guards the interest of the disadvantaged at village level in relation to land.

ii. Judicial Mechanism

a) The Village Land Council

The Village Land Council is under the Ministry of Local Government (District Authorities). It is responsible to the Director of the District Council. This body is established under Section 167(1)(e) of the Land Act to mean one of the Courts of law empowered to deal with land matters. The Village Land Act supports the proposition that the Village Land Council is the Court of law vested with powers to deal with land disputes. The same proposition is provided for, under the Courts (Land Dispute Settlement) Act.  

b) The Village Land Council within a period of thirty days from the date of issuing a decision it will be by majority vote but in case of equal votes the convener shall have a casting vote. The complete quorum for the meeting shall be four members of whom at least one shall be a woman. The Registrar of Villages shall be responsible for total administrative functions of the Village Land Council. This means the Registrar shall be the Chief Executive of Village Land Councils. In Tanzania, this body is under the Ministry of Regional Administration and Local Government Authorities commonly known as TAMISEMI (Tawala za Mikoa na Serikali za Mitaa).

The Village Land Council is vested with two major powers: Appellate capacity and the Mediation capacity.

The Appellate Capacity: the first instance on appellate capacity is when the decision of the Village Adjudication Committee is challenged by any interested party aggrieved by the decision through appeal. The decision so issued by the Committee may be challenged through appeal to the Village Land Council within a period of thirty days from the date provisional adjudication record was published by the Committee. In the course of exercising such powers, the Council is with all the powers and shall comply with all the procedures applicable to a village adjudication committee. It is as well empowered to amend the adjudication record, correct any error in the adjudication record and or direct that the village adjudication adviser conduct further investigation into the subject matter of appeal. For the best interest of justice when the Council deems it just, may call upon a person who is likely to be affected by the decision but has not appealed and avail him with an opportunity of being heard on appeal before the appeal is determined. It is interesting to note here that the decision issued thereto is appealable to the District Land and Housing Tribunal within the locality and it is done after the leave has been sought.

The second instance where the Village Land Council operates as an appellate body is under the process for staying the suits. It is provided among other things that, if the consent of the Chairperson of the village adjudication committee or where the central adjudication is taking place, no person is allowed to institute any civil action or proceedings of any kind in relation to land adjudication until the adjudication record is final. Likewise where any action or proceeding has begun be it village adjudication or application for determination of the adjudication no proceedings may be instituted until the finality of the said proceedings. Any one aggrieved by the decision of the Chairman in this regard may appeal to the Village Land Council within fourteen days and may further appeal to the Court of Competent jurisdiction.

Mediation Capacity of the Village Land Council: The Council is purposely established for this main task when it falls within the hierarchy of the bodies established to settle land disputes. It is set as the lowest court with exclusive jurisdiction to settle land disputes. The rationale of its establishment is to mediate the parties and thus assists them to arrive at mutually acceptable solution on any matter concerning land. Similarly Act No. 2 of 2002 provides for the basic functions of the Council as to receive complaints from the parties in respect of land, convene the meeting for hearing the disputes thereof and lastly to mediate the parties.

The powers of the Village Land Council to operate as the mediating body are limited under Section 61 of the Village Land Act. It provides for two instances where the Village Land Council is bound to exercise its mediation capacity, First, when there is a joint village lands use agreement between the villages. This agreement is entered between the village council and the other village council from another village concerning the use of the village by an individual, group of persons which was traditionally used by those groups and it is partly in one village and partly to the other village. The said agreement may be amended from time to time on mutual agreement. The procedure

75 See Section 3(2)(a) of Courts (Land Dispute Settlement)Act, No.2 of 2002
76 See Section 60(2) (a)and (b) of the Village Land Act
77 See Section 60(S) supra
78 See Section 23 of Cap.287 R.E 2002 and Section 6 (a) of Courts’ (Land Dispute Settlement) Act, No.2 of 2002
79 See Section 55(1) of the Village Land Act
80 See Section 55 (1) and Section 54 (7) ibid.
81 See Section 55(4) Supra
82 See Section 55(5) ibid.
83 See Section 59(1) ibid.
84 See Section 59(1), (2) and (3) ibid.
85 See Section 167(1) (e) of Cap. 114; Section 62(2)(e) of Cap. 114 and Section 3(1) and (2) of The Courts’ (Land Dispute Settlement) Act, No. 2 of 2002.
86 See Section 60(1) of the Village Land Act, Cap. 114 R.E 2002
87 Section 7 of Act No.2 of 2002
88 See Section 11 of the Village Land Act, Cap. 114 R.E 2002
for such agreement is well established.\textsuperscript{89} In case of any dispute thereof, then Village Land Council may stand to mediate the parties to the agreement. \textit{Second}, when there is a land sharing arrangements between the pastoralists and the agriculturalists.\textsuperscript{90} This agreement is entered between the dual users of the village land that is the pastoralists and the agriculturalists. In case of any adjudication process in respect to the said and that both interested parties are still willing to use the said in duality an agreement may be entered in respect to joint use of the village land. In that agreement the rights to use the said land shall be established and the arrangements for resolving any disputes between them shall be set.\textsuperscript{91} That being the case the agreement shall be registered in the Village Land Register and the District Register. In case of any dispute therefore in respect to the agreement, the Village Land Council shall be vested with jurisdiction to mediate the parties thereto.

It is well settled that in both instances above explained (where the Village Council is vested with power to mediate the parties), in case mediation fails, the parties are entitled to refer the matter to the Courts of Competent jurisdiction.\textsuperscript{92} The courts of competent jurisdiction for this matter are the Ward Tribunal,\textsuperscript{93} though the wording of these two laws on what should be the competent court of reference is still debatable depending on the pecuniary jurisdiction of these Courts preferred. It is established that the Court of Competent jurisdiction is accessed by way of reference. Still this sounds differently from the ordinary concept of the term reference which the legal proceedings are used to.\textsuperscript{94}

\textit{b) The Ward Tribunal}

This body is under the control of the Ministry of Regional Administration Local Government and accountable to the Director of District Council of the locality. The Ward Tribunal has ordinarily been a body vested with the original jurisdiction to entertain land disputes. This body is governed by two laws in the process of functioning as a quasi-judicial body.\textsuperscript{95} The members of the Tribunal are appointed by the Ward Committee and there shall be a Secretary to the Tribunal who also shall be appointed by the local government where the tribunal belongs with the recommendation of the Ward Committee.\textsuperscript{96} In the course of exercising its powers, the Tribunal is not bound by any rules of evidence or procedure applicable to any court and thus shall regulate the procedures of its own.\textsuperscript{97} Despite this fact the Courts of law have been in a position to give guidelines on the procedures particularly when there is a sign of miscarriage of justice in the course of exercising the powers of the tribunal.\textsuperscript{98}

In this case above, Dr. Bwana, J.A had this to say, ‘...We are alive to the fact that under Section 15 of the Ward Tribunals Act, Cap. 206 R.E 2002 The Ward Tribunals are not bound by any rules of evidence or procedure applicable to any court...however, the procedure before the Ward Tribunal, in our considered view contain several irregularities which would warrant retrial’...p.4

This brings in the concept that the proceedings are not absolutely governed by the tribunal alone but also the best interest of justice.

On the other hand in the course of executing its functions the Tribunal shall be guided by the principles of natural justice where the statements of witnesses produced by parties to a complaint are heard and relevant document produced by any party are dully examined.\textsuperscript{99}

Furthermore, the Tribunal must seek to do justice in order to maintain peace and harmony within the locality. That is why the Tribunal must give equal opportunity to each party to explain his part of the matter and to present his witnesses without any chances of bias either from the members of the Tribunal themselves as interested parties to the subject matter or any kind of bias.

From both positions of the Laws governing the Tribunal, that is the Ward Tribunal Act and Act No.2 of 202, the Court is vested with triple sides of exercising its functions. The \textit{first} side comes in when the Ward Tribunal sits as \textit{mediating body}.	extsuperscript{100} By virtue of this power, the Ward Tribunal is vested with duty to secure peace and harmony within the locality by mediating the parties to settle their land matter amicably. The Tribunal in that capacity is vested with powers to deal with all matters that arise from both the Land Act and the Village Land Act. The composition of the Ward Tribunal when sitting for mediation shall consist of three members of whom at least one shall be a woman.\textsuperscript{101} In this instance the Chairman shall select all the three members including the convenor who shall also preside at the meeting of the Tribunal. The presiding chairman shall have a casting vote in case of equal votes.\textsuperscript{102} This was, as well a judicial position of the Court of record in the case of \textit{Juliana Kiyeyeu Vs Said Mpewa,}\textsuperscript{103} provided for the right quorum of the Ward

\textsuperscript{89} See Section 11 ibid. In this case the Village Council of one village meets the interested groups for a meeting, and a draft of the agreement is prepared (taking into regard the present representation of interested groups), the district council has to be informed and lastly the Village Assembly of each village must receive the draft. If it is approved by the village Assemblies then it is signed.
\textsuperscript{90} See Section 58 of the Village Land Act, Cap. 114 R.E 2002
\textsuperscript{91} See Section 58(1)(a),(b) of the Village Land Act, Cap.114 R.E 2002
\textsuperscript{92} See Section 62(1) of the Village Land Act
\textsuperscript{93} See Section 9 of the Courts(Land Dispute Settlement)Act
\textsuperscript{94} There are various categories of reference that is a reference from the Subordinate Court to the High Court of Tanzania, a reference from a taxing master to the High Court Judge in respect to the bill of cost, a reference from the single justice of appeal to the full bench or reference on constitutional matter. See F. Mirindo (2014), \textit{Administration of Justice in Mainland Tanzania}, 1st Ed.Law Afica, pp.662 to 665
\textsuperscript{95} See Section 3 The Ward Tribunal Act, Cap. 206 and Section 10 of the Land Dispute Courts Act, No.2 Of 2002
\textsuperscript{96} See Section 4 of Cap.206 R.E 2002
\textsuperscript{97} See Section 15 ibid
\textsuperscript{98} \textit{William Stephen Vs Ms.Leah Julius(Administratrix of estate of the late Neea Saboro}, Civil Appeal No. 65 of 2013, Court of Appeal of Tanzania at Arusha
\textsuperscript{99} See Section 15 of Cap. 206 R.E 2002
\textsuperscript{100} See Section 13 of Act No.2 of 2002
\textsuperscript{101} See Section 14 ibid
\textsuperscript{102} See Section 14 supra
\textsuperscript{103} Juliana Kiyeyeu Vs Said Mpewa Misc. Land Case Appeal No.31 of 2012 High Court of Tanzania (Land Division)at Iringa p.5, See also the case \textit{Halmashauri ya Walei Parokia ya
Tribunal on mediation as the Chairman, three members, the Secretary and the Convener.

The second side of the tribunal is when the matter is placed to it as a court of original jurisdiction on land. This is what is termed as hearing and deciding the matter in dispute as a court per se. It happens when the Tribunal fails to mediate the parties. Then it transforms itself from a mediating instrument by just changing the composition of the quorum. The court must be composed of not less than four members and not more than eight members of whom three shall be women. This quorum has been distinguished from the above instance when the Tribunal sits as a mediating body. In the case of Joseph Kitango Vs Paulina, the court revealed the position on what should constitute a ward tribunal when it sits to try the matter and decide on it as a court of original jurisdiction. It reiterated the position of Section 11 of Act No. 2 of 2002. It has added a mandatory requirement in the course of interpretation that the names of the parties as to distinguish them from males and females must be shown as to ascertain whether the quorum was complete. In other cases failure to mention the names of the members who constituted the quorum has rendered the entire proceedings at the tribunal a nullity. This reveals the seriousness and the relevance of having a properly constituted quorum at this level. The court held. In the course of entertaining the subject matter, the Tribunal is vested with pecuniary jurisdiction of not more than three Million.

Despite all this express provision from the law regarding the pecuniary jurisdiction of the Tribunal, various issues have arisen on the jurisdiction of the Ward Tribunal when the subject matter may seem exceeding the jurisdiction of the Tribunal but there is no valuation report to establish it. In the case of John Malombola Vs Remmy Kwayu, Mansoor J. held among other things that the value of the premises cannot be established in the absence of a valuation report. There is a litany of cases to this effect. There is no valuation report to establish it. In the case of Mgongola basin commonly known as Kwaboga within Kambala village in Mvomero, such instances have happened in the dispute between the Farmers and the Pastoralists over the Mgongola Basin in Mvomero. Such cases where the Village Land Council has not been able to resolve them, a reference is made to the Ward Tribunal. But it is a surprise that in the case of Mgongola basin commonly known as Kwaboga within Kambala village in Mkindo Ward in Mvomero, the case has been different.

A reference to the Ward Tribunal is instituted by making of a complaint to the secretary of a Tribunal, the Secretary of an appropriate authority, the Chairman of a Village Council or a ten-cell leader which either be made orally or in writings. When the complaint is in writings shall be signed by the Complainant. In case a complaint is made to any person, that person shall, if he is not the Secretary of the Tribunal, cause it to be submitted to the Secretary of the Tribunal who shall enter it in the records of the Tribunal and arrange for it to be heard and determined by the Tribunal in accordance with the procedure of the Tribunal for the hearing and determination of disputes submitted to it.

Depending on the matter in dispute that has been brought to the tribunal for trial emanating from a civil nature, the Tribunal has powers to order recovery of possession of land, order the pecuniary performance of any contract, make orders as in nature of injunction, award of any amount claimed, award compensation, payment of any costs or any orders as the best of interest deems it right. It is very important to note here that once the Ward Tribunal has issued any award or order or judgment, it is not empowered to execute it. The power to execute the decree issued by the Ward Tribunal is vested to the District Land and Housing Tribunal within a given locality.

Matembwe Vs Petro Kitalula, Misc. Land Case Appeal No. 29 of 2010, High Court of Tanzania; See also the case of Jne Kisonga Vs Saaid Mohamed Land Appeal No. 59 of 2009, High Court of Tanzania(Land Division) at Dar Es Salaam

Kitango Vs Paulina, Misc. Land Case Appeal No. 26 of 2008, High Court of Tanzania (Land Division) at Iringa

Kitango Julius(Administratrix of estate of the late Neeva Saboro, Civil Appeal No. 65 of 2013, Court of Appeal of Tanzania at Arusha

See the case of Nahodha Mpaka Vs Agatha Zombe, Land Appeal No. 1 of 2005, High Court Of Tanzania, at Songea p.2

See Section 15 of Act No.2 of 2002

John Malombola Vs Remmy Kwayu Misc. Land Appeal No. 91 of 2009, High Court of Tanzania(Land Division), at Dar Es Salaam

See also the case of Zaidi Baraka Vs Engen Petroleum (T) Ltd, Land Case No. 135 of 2004, High Court of Tanzania(Land Division); See also the Case of Lweshabura Mzinja Vs Julieta Jacob, Misc. Land Appeal No. 7 of 2005, High Court of Tanzania

See Section 17 of Act No. 2 of 2002; See also Section 11, 58, 61 and 62 of Cap. 114 R.E 2002

See Legal and Human Rights Center, Tanzania Human Right Report of 2013 issued by the Legal and Human Right Center in March 2014, p.156-161: In this instance the the farmers and the pastoralists are conflict of ownership and the usage right of the basin situated in Kambala Village in Mvomero, Morogoro for a number of years now. Pastoralists normally have been using the land in dispute for grazing cattle every season after harvest of farmers produce. By 2013, the farmers have prevented the pastoralists to use the land even after the farmers had harvested their crops. Thus a dispute over that land.

See the case of Kambala Village Council Vs Jaribu Mwishehe and 19 Others, Application No. 127 of 2005, In the District Land and Housing Tribunal for Morogoro at Morogoro, issued on 02/06/2015

See Section 11 of Cap 206 R.E 2002

See Section 16 of Act No. 2 of 2002

See Section 16(3) ibid
It has been well provided for, that the Advocates have no audience at the Ward Tribunal. It keeps a legal right of representation reserved only for any relative or any member of the household of either to the proceedings to appear on that behalf. An appearance by such party, is only acceptable when it is done at the desire of the interested party to the dispute. In case it is a body corporate, the Director or any authorized person on that behalf is availed with a right to appear.

It is well recognized that a right of appeal is one of the Constitutional rights at the Ward Tribunal. This right is vested on that behalf. An appearance by such party, is only acceptable when it is done at the desire of the interested party to the dispute. In case it is a body corporate, the Director or any authorized person on that behalf is availed with a right to appear.

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intention is to justify on the justiceability of it in terms of consistency to the Parent Act or any subsidiary legislation and whether it does not conflict the rules of natural justice. In exercising revisionary powers the tribunal may invoke the powers vested to it on appeal. This position is line with decision of the Court of record in the case of Nahodha Mpaka Vs Agatha Zombe.132 That being the case the quorum which constitutes the tribunal on appeal applies mutatis mutandis to revision. Though at this level, these Courts are with different Registrars and on different Ministries as quasi judicial bodies as above articulated. The chain of command here is not upright as to reveal a smooth operation of these two bodies.

The Tribunal is lastly vested with powers to execute its order and the orders of the Ward Tribunal. It is important to note here that the Ward Tribunal cannot execute the decree of its own such powers are vested to the District Land and Housing Tribunal.133 On the same reasoning the Tribunal is vested with powers to execute its own orders and decree.134

d) The High Court Tanzania

This study deals with the High Court generally and not The High Court (Land Division) per se. This is because, the High Court of Tanzania (Land Division) is no longer vested with exclusive jurisdiction to entertain land matters.135 These powers are also vested to the High Court of Tanzania (Main Registry).136 It is on this regard that the Courts that have been left with exclusive jurisdiction on land matters are only the Village Land Council, The Ward Tribunal and the District Land and Housing Tribunals in Mainland Tanzania. Any High Court of Tanzania is established by the Constitution of the United Republic of Tanzania.137 The jurisdiction of the High Court in a special power may be vested to the Court by the statutory law.138 In this case the statutory powers of this High Court derive from the Courts (Land Dispute Settlement) Act.139 The same force and validity emanates from the Land Act and the Village Land Act.140 In exercising its powers under the law the Court has various obligations. It is a Court which entertains matters of which it has original jurisdiction, appeals from the District Land and Housing Tribunal, revisionary and supervisory powers and it executes its own orders.

When the Court sits as a Court of original jurisdiction, it is empowered to deal with all subject matters of land nature whose pecuniary jurisdiction exceeds fifty and forty million shillings for immovable and movable property respectively.141 In all proceedings involving the Public Corporations and other matters relating to the National Interests as the Minister for Lands may publish in the gazette, touching land shall be dealt with by the High Court in its status as a Court of original jurisdiction. Despite this right position but still the District Land and Housing Tribunals may deal with land matters touching the public corporations in special circumstances. These include within the locality where there is no High Court.142 On the same circumstance the High Court is vested with mandate in all the proceedings relating to land but where there is no specific Court that has been vested with such powers.143

The High Court on the other hand function as an appellate Court in case a party to the proceedings is aggrieved by the decision of the District Land and Housing Tribunal. It provided that an appeal is a right which has to be exercised within sixty days from the date of judgment.144 It is the discretion of the Court to enlarge time upon advancing a good cause or for the best interest of justice. The appeal to the High Court is lodged to the Court whose decision is to be challenged by way of petition.

The appeals that originate from the proceedings that emanated from the Ward Tribunal must contain the petition of appeal, record of the proceedings, the judgment and the decree and the same must be presented at the High Court by the Tribunal within fourteen days from the date of filing the petition. In this instance, the High Court shall sit with two assessors. Where there is any issue basing on customary law, the High Court may refer the said matter to the Expert or panel of experts,145 though their decision may not bind the judge to his decision on appeal.

In ordinary appeals from the District Land and Housing Tribunal where original jurisdiction was exercised, the Judge will sit alone to determine an appeal. The decision may thereof be confirmed, reversed, amended, varied in any manner or may take or certify for additional evidence.146

The same powers on appeal are also vested to the High Court when exercising powers to revise the decision of the District Land and Housing Tribunal. For that matter the High Court Judge sits to ascertain the legality, appropriate and correctness of the Tribunal’s decisions.

The High Court when act as a supervisory body, may call for records, inspect them and give directions to the Tribunal. It may call upon any proceedings from the subordinate tribunals either suo motu or upon application by any interested party for directives and correction of errors if any. The decision given thereof obtains force and validity as if the powers were exercised

132 See also Section 36(2) See also Nahodha Mpaka Vs Agatha Zombe, Land Appeal No.1 of 2005, High Court of Tanzania, at Songea;
133 See Section 16(3) of Act No.2 of 2002
134 See Section 33(3) ibid
135 See Written Laws (Miscellaneous Amendments) Acts, No.2 of 2010
136 See Sections 17,19, 21, 35 and 36 ibid.;
137 See Article 108(1) of Cap. 2 R.E 2002
138 See the case of Fahari Bottlers Ltd and Another Vs The Registrar of Companies and Another, Civil Revision No. 1 of 1999 CAT at Dar Es Salaam (Unreported)
139 See Section 3 and 37 of Act No. 2 of 2002
140 See Sections 167 of Cap. 113 R.E 2002 and 62 of the Cap.
114 R.E 2002
141 See Section 37(a)and (b) of Act No. 2 of 2002
142 See Section 37(2) of Act No.2 of 2002 as amended by the Written Laws (Miscellaneous Amendments )2(Act No.11 of 2005; See also Mirindo, F., (2014), Administration of Justice in Mainland Tanzania, 1st Ed. Law Africa, p.145
143 See Section 37(e) of Act No 2 of 2002
144 See Section 38(1) ibid.
145 See The 4th Schedule of the Magistrate Courts Act, Cap 11 R.E 2002
146 See Section 41 of Act No. 2 of 2002
on appeal. 147 In case any party is aggrieved by the decision of the High Court in any instance, may appeal to the Court of Appeal of Tanzania upon seeking leave from the High Court. 148 If it turns out that the High Court has refrained from granting leave to the applicant, then the next avenue to the aggrieved party is to access the Court of Appeal of Tanzania by a second bite. This is done within fourteen days from the date of refusal. 149 It is a trite principle of law that a rejected application for leave by the High Court cannot be challenged by revision, reference or appeal. Various cases have supported this position. 150

On the other hand, the High Court is vested with powers to execute the decree of its own. At the same time when the Court deems it right may order execution of the decree to be effected by the another court subordinate to it. 151 For the purpose of administrative operations, the High Court of Tanzania and the Court of Appeal are under the Ministry of Constitution and Legal Affairs.

e) The Court of Appeal of Tanzania

This is the supreme Court in Tanzania and it is established under the Constitution. 152 The laws vests this Court with powers to determine appeals on land matters. 153 It is a trite principle of law that the Court of Appeal of Tanzania is governed by separate laws in conducting its proceedings. It is governed by the Appellate Jurisdiction Act, 154 and the Court of Appeal Rules 2009. The Court is also empowered like any other land Courts to apply laws as they are elaborated under the Land Act. 155 In all land matters any person aggrieved by the decision of the land Courts must seek leave in order to appeal to the Court of Appeal. 156 When leave is reject by the High Court then leave has to be sought to the Court of Appeal as a second bite. 157 But in all matters which originate from the Ward Tribunal and appeal is then preferred from the third appeal, the applicant shall be required to seek a certificate from the High Court certifying the existence of the point of law involved on appeal. 158

There are basic requirements for the appeal to be preferred at the Court of Appeal. The First thing is the notice of appeal within thirty days from the date of the decision and the same has to be lodged with the Registrar of the High Court and one copy out of the triple copies shall be filed to the relevant registry. 159 The notice must be in the prescribed form. 160 The process of filing of a notice has nothing to do with seeking of the leave or seeking for a certificate on the point of law. Each has its own avenue in the course of proceedings. It is the notice that states whether an appeal is against the whole judgment or part of it. The notice must be served to the Respondent within fourteen days from the date of filing it. The second requirement is application for leave or certificate on the point of law as the case may be. In case all duly done as per the law there follows a step of instituting an appeal. The memorandum of appeal, security for cost and the record of appeal must be filed within sixty days from the date of filing the notice. 161 For the best interest of justice, the Court of Appeal may order after satisfying itself that the party is unable to deposit prior the security for costs, allow the appeal to filed without depositing security for costs. 162 The memorandum of appeal and its record of appeal shall be served to the Respondent within seven days from the date of filing. 163 Presentation of written submission follows the event. 164 When all this is successful, in case there are Preliminary Objections, three clear day notice must be given to either party before a hearing date. 165 If the same is duly served, the Court shall entertain it or adjourn the matter in favour of another date for determining the objections.

A notice of not less than fourteen days shall be given to the parties summoning them for hearing of an appeal. 166 The judgment shall be then pronounced. 167

The Court of appeal is also vested with powers to revise the proceedings of the High Court when performing the functions as a land Court. Revisional powers of the Court may be done suo motu or by an interested party to the proceedings. 168 The Court is moved by a notice of motion and an affidavit. There is no requirement for annexing any other document to the application. It is clear therefore, that when the matters have been initiated by the Court suo motu only a notice to be issued by the Court to the parties is required. In the course of exercising the revisionary powers the Court of Appeal direct as if it is sitting on appeal.

The Court is also vested with review powers of its own decision. This remedy is entertained in a very limited way. Rule 66, 169 provides for the instance which attract this remedy. These include the instance when the decision was based on a manifest error on the face of the record resulting in the miscarriage of

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147 See Section 43 ibid. 148 See also the case of Dero Investment Ltd Vs Heykel Berete, Civil Appeal No 92 of 2004, CAT at Dar Es Salaam (Unreported). This case supported the position of Section 47(1) of Act No. 2 of 2002 149 See Rule 45(b) of the Court of Appeal Rules, 2009 150 Njeru Mulugula Vs Sander Samson Sanga and Another, Civil Application No. 4 of 2002, CAT, at Mbeya (Unreported), Manoharlal Aggarwal Vs Tanganyika Land Agency Ltd and 8 Others, Civil Reference No. No.11 CAT, Dar Es Salaam(unreported); See also Auguster Salanje Vs Mussa Pemba (1992) T.LR 62 151 See Section 34 of the Civil Procedure Code, Cap.33 R.E 2002 as it applies in accordance with Section 51 of Act No.2 of 2002 152 See Article 117 of Cap. 2 R.E 2002 153 See Section 48(1) of Act No. 2 of 2002 154 Cap. 141 R.E 2002 155 See Section 180 of the Land Act, Cap. 113 R.E 2002 156 See Sections 47(1) of Act No. 2 of 2002, See also Section 5(2) of the Cap. 141 R.E 2002 157 See Section 5(1) (c ) of Cap. 141 R.E 2002 158 See Section 5(2)(c ) of Cap. 141 R.E 2002 159 See rule 83 of the Court of Appeal Rules 160 Form D as it is in the Schedule of the Court of Appeal Rules, 2009 161 See Rule 90 of the Court of Appeal Rules 2009 162 See Rule 128 ibid 163 See Rule 97 ibid 164 See Rule 106 ibid 165 See Rule 107 ibid 166 See Rule 108 Supra 167 See Rule 116 ibid 168 See Section 4 of the Appellate Jurisdiction Act Cap. 141 R.E 2002 169 Court of Appeal Rules, 2009
justice; when a party was wrongly deprived of an opportunity to be heard;

When the court’s decision is a nullity; the court had no jurisdiction to entertain the case; or
the judgment was procured illegally, or by fraud or perjury.

The application for review applies in the same manner as it is to revision save that review is done by the same Court which issued the order or judgment as the case may be and within sixty days from the date of the order or judgment. The Court is moved by the notice of motion. The decision issued thereto is final and conclusive.

It is also well established that The Court of Appeal may sit as a Court of reference unto the matter that emanate from its own decision. It is governed by Rule 62 of the Court of Appeal Rules. The takes place when a decision of a single Justice seeks to be varied, discharged or reversed. It applies in accordance with Article 123 of the Constitution of the United Republic of Tanzania.

IV. INACCESSIBILITY TO LAND DISPUTE SETTLEMENT MACHINERIES

In this context the concepts of accessibility visa vis inaccessibility to justice have been well documented. The same Constitution has been able to show in what style and mode to those who desire to access justice should be treated and the right position where procedural technicalities give way to substantive justice. There is a litany of cases where judicial interpretation of the above principle has been laid down. In this case, it was held among other things that,

“...the right of access to court is indeed foundational to the stability of an orderly society. It ensures the peaceful, regulated and institutionalized mechanisms to resolve disputes, without resorting to self help. The right of access to court is a bulwark against vigilantism, and the chaos and anarchy which it causes. Construed in this context of the rule of law and the principle against self help in particular, access to court is indeed of cardinal importance. As a result, very powerful considerations would be required for its limitation to be reasonable and justifiable.

Various jurists have also been in a position to elaborate what access to justice in its strict sense means. Access to justice assumes a position that Courts should be open to all persons whose rights have been affected. Likewise, Maina Peter is of the view that access to justice connotes ability of the aggrieved party to challenge violative actions in Courts of law, accessibility of Courts, and ability of courts to give effective remedies, equal and fair treatment before the eyes of the law. It is therefore a trite principle of law that any person who seems aggrieved of his interest must be able to access the court for the remedy.

With this school of thought, the term Courts in respect to land disputes bears the meaning ascribed to it by the Land Act, 1999. The law provides for the said Courts as Village Land Council, Ward Tribunal, District Land and Housing Tribunal, High Court of Tanzania and the Court of Appeal of Tanzania.

In Morogoro Region where this paper focuses, there are various instances which in themselves reveal that inaccessibility to land dispute machineries warrant the endless disputes within the locality.

1.1 Geographical and Distance inaccessibility of the Tribunals in Morogoro:

There is no dispute that Morogoro Region is one of the Regions reported of land disputes in Mainland Tanzania. Morogoro Region consists of seven Districts, that is Ulanga, Marinyi, Kilombero, Kilosa, Mvomero, Gairo and Morogoro District Council.

It is only Kilombero, Kilosa and Morogoro Urban which have operating Tribunals. In Kilosa for instance, there are almost 39 Wards and each Ward has a Ward Tribunal. But this Tribunal serves two Districts that is Gairo and Kilosa Districts. But yet still, there is no permanent stationed Chairperson at the Tribunal from the time it was established. The two Chairpersons who serve in Morogoro Urban render service on rotation basis where only two weeks in a month the District Land and Housing Tribunal preside over matters at the Tribunal. Kilombero District has a District Land and Housing tribunal located at Ifakara. It serves three Districts, that is Ulanga, Kilombero and Marinyi Districts while each District has more than thirty Ward Tribunals. There is only one Chairperson stationed at the Tribunal at Ifakara District Land and Housing Tribunal. It is not strange as it is a usual practice that a case to an aggrieved party originating from the Ward Tribunal comes by way of appeal to the District Land and Housing Tribunal. Likewise, a decision on appeal from the District Land and Housing Tribunal is preferred to the High Court of Tanzania situated in Dar Es Salaam, then to the Court of Appeal of Tanzania situated in Dar Es Salaam. There is a litany of cases that in practice, people lodge their cases in such Tribunal but end up in despair despite such a long distance to access justice. In the case of Twaiibu Mseleme Vs Ally Omary Madenge, the case

170 See Article 13(3) and (6)(a) of Cap.2 R.E 2002
171 Article 107A(2) (e) supra
172 The National Housing Corporation Vs Etenes, Civil Application No. 10 of 2005, CAT at DSM (Unreported)
(984)
(1968) E.A 392
174 See Julius Ndyanabo case, loc.cit.fn. 172
175 See Julius Ndyanabo Vs AG, Civil Appeal No. 64 of 2001, CAT at DSM; Cropper Vs Smith (1884)
26 CL.D.700 at p. 700; General Marketing Co. Ltd Vs A.A.Shariff (1980) T.L.R. 61 p.65; Manji Ltd Vs Arusha General Stores (1991) TLR 165, Rawal Versus Mombasa Hardware
176 See Sections 2, 167 of the Land Act, Cap. 113 R.E 2002; See also Section 61 of the Village Land Act, Cap. 114
177 R.E 2002
178 Government Notice No. 301 dated 22nd August 2014
179 Twaibu Mseleme Vs Ally Omary Madenge, Misc. Land Appeal No. 106 of 2013, High Court of Tanzania at Dar
was lodged originating from Land Appeal No. 32 of 2013 originating from the decision of the Ward Tribunal of Mofu. It was dismissed for want of prosecution at the High Court of Dar Es Salaam and no consideration was put to how long the parties navigated to prosecute their case from Marinyi, then Ifakara and lastly High Court of Tanzania at Dar Es Salaam.

1.2 Execution of the decree

It is a common practice, that the Court issuing judgment has always been an executing Court of its orders. But it is different from what is taking place at the Ward Tribunals where the Ward Tribunal cannot execute its orders. An application for execution of the decree issued by the Ward has to be executed by the District Land and Housing Tribunal within the locality. In Morogoro, almost every ward has a Ward Tribunal/Court. It becomes cumbersome for instance a person from Utenguule Ward travelling the whole way through, almost 100 kilometers to execute a decree at Ifakara District Land and Housing Tribunal in Kilombero. Likewise a person moving from Uleling’ombe Ward travelling almost 100 kilometers to execute a decree at Kilosa District Land and Housing Tribunal, a Court which does not have a stationed Chairperson from its commencement. In most cases, a person has to undergo ordinary court procedures for executing a decree which include lodging an application, securing summons and serving them, attending the session and sometimes finding a Chairman who is a single presiding Chairman adjourning the matter possibly for site visit or illness or sometimes for official duties. Furthermore, the decree intended to be executed emanates from Swahili language, which is the language of record at the Ward Tribunal though an application for execution has to be lodged in English language as the language of record at the District Land and Housing Tribunal. Most of the villagers have to invoke an expert to fill in the application but it is as well such hard for them to argue on the application which is reduced down in English basing on technical wording with legal jargons. Execution is not only hard to ordinary people but to the legal practitioners as well.

To the practitioners it may be easier because it is part and parcel of their duties, but to ordinary people it sounds an embarrassment which in itself may lead to a despair and mistrust to the Courts of law.

1.3 Appeal to the District Land and Housing Tribunal from the Village Land Council and leave seeking process

This position seems truly unusual to ordinary Court practice. Village Land Council receives appeals from the Village Adjudication Committee. Now a person aggrieved by the decision of the Village Council has to prefer an appeal to the District Land and Housing Tribunal as per obligation of the Village Land Adjudication Committee. Despite this position, but yet one may raise a question on why should an appeal be preferred to the District Land and Housing Tribunal without being preferred to the Ward Tribunal as per ordinary court hierarchy. But furthermore, in Morogoro Region there are almost 665 Villages, whereas only three District Land and Housing Tribunals are in place with a backlog of ordinary cases lodged thereto of not less than 1000 cases pending in each Tribunal. Adding cases of the like from the Village Land Council on appeal may create unnecessary problems to the people than it is if the Ward Tribunal was skipped on this procedure.

Under this trend which seems unusual to ordinary court processes, there is a requirement for leave seeking if an aggrieved party intends to appeal from the Village Land Council to the District Land and Housing Tribunal. There is no regulation set forth on how villagers can move the Court to obtain the redress and within what time. It is obvious, that these villagers will move miles to access the District Land and Housing Tribunal and yet will have to undergo such technical procedures which shall require them to seek for an expert let alone moving to seek for such experts whom most of them are centered in towns and cities than it is to villages.

4.4. Emolments of the Personnels to the Land settlement Machineries

The Village Land Council and the Ward Council have always been the Courts of the first instance at a village level. All these bodies are under the Prime Minister’s Office, Ministry of Regional Administration and Local Government and as such are responsible to the Registrar of Villages administratively. From experience point of view, it has been observed that the members of these bodies do not have a formal payment from Government. It is a work accompanied with volunteering. It is surprising to see that the Courts of the instance do not have formal payments. It may sometimes, though not always, compromise the impartiality of these Courts of first instance. Various jurists have overemphasized that for the proper operation of the judicial and quasi judicial bodies, they must be paid salaries which are adequate to their responsibilities in order to get rid of temptation to bribery and corruption.

Now, the contributions effected by the litigants in the course of filing the Complaints and site visiting have been the source of self redress to the members of these courts. Any person would wonder what would happen if either party does not contribute or he is not in a financial position to give such contributions to the Courts. It is emphasized that these personnel must be adequately paid but in the instance at hand there are no payments at all save as above said. Seemingly and more often, preferred to the Ward Tribunal as per ordinary court hierarchy. But furthermore, in Morogoro Region there are almost 665 Villages, whereas only three District Land and Housing Tribunals are in place with a backlog of ordinary cases lodged thereto of not less than 1000 cases pending in each Tribunal. Adding cases of the like from the Village Land Council on appeal may create unnecessary problems to the people than it is if the Ward Tribunal was skipped on this procedure.

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people have been resorting to ‘self help’ than it is to these courts.  

1.4 Controversy in Administrative Command as per Court Hierarchy

These Courts set to administer justice on land matters possess an hierarchy which administratively and on quasi judicial capacity create a contradictory point on who commands who in the entire process of justice administration on land matters. That is to say, The Village Council and the Ward Tribunal are subject to the Prime Minister’s Office, Ministry of Regional Administration and Local Government with their independent Registrar. Meanwhile the District Land and Housing Tribunal is under the Ministry of Lands, Housing and Settlement Development with its own Registrar. On the other hand, the High Court of Tanzania and the Court of Appeal of Tanzania are under the Judiciary which falls as a Department to the Ministry and Constitution and Legal Affairs.

There is no provision within any of the laws that gives express directives to these bodies in case of administrative order. The District Land and Housing Tribunal for instance may not legally give order to the Ward Tribunal without addressing the same to the Registrar of the Wards. Therefore there is no direct responsibility accommodated to these bodies as it is to ordinary Court hierarchy without a third party approval. In this case, the Registrar of the High Court of Tanzania has to communicate to the Registrar of the District Land and Housing Tribunal in case of any judicial function of the Court. Otherwise, the Chairman of the District Land and Housing Tribunal may refrain from receiving that order since the High Court of Tanzania is not an immediate supervisor hierarchically. There may arise some instances where the District Land and Housing Tribunal orders for immediate submission of the Ward Tribunal file, but the Chairperson hesitates or protects himself of having the file lost and yet no action is taken by the District Land and Housing Tribunal on the above given reason. People may be aggrieved and thus resort to alternative way which may not attract the ear of reasonable person.

1.5 Security of Tenure to the Tribunal Personnel

It is a trite principle of law that any instrument administering justice must be seen to be impartial. It must be independent for the better administration of justice. This includes security of tenure to the personnel exercising these duties and the institution itself. The rationale for having an independent body whose office is secured is not far to trace. Justice, Mfalila Lameck, (as he then was) puts it briefly that, ‘...it may bring them into conflict with those in authority in the state. That is why it is of the highest importance that judges should be independent and impartial. …they stand between the individual and the state protecting the individual from any interference with his freedom which is not justified by law. In order to be independent and impartial, they must be[able] to survive in their office. They must not be liable to be removed at the pleasure of the Government...’

The law governing and establishing these bodies has not set any clause either, protecting this avenue which is a key stone to rule of law. For instance, what is seen on record is the appointment of the Chairman of the District Land and Housing Tribunal by the Minister responsible for lands but nothing is revealed to protect the said interest after the appointment. It is not well established in what manner the appointed Chairman can withstand the penalty, inducement, threat by the appointing body in the entire process which may be seen as influencing factor to the decision issued by the Chairman. It is shown only under the Regulations that in case the Minister intends to remove the Chairman from office, may conduct an inquiry. There is no mandatory requirement for removal which is imputed to the Minister in establishing an inquiry under Section 18 of the Land Act. It is rather discretionary with using ‘may’ and not ‘shall’ wording. It does not give a conclusive position that the Minister is bound by the findings of the Inquiry in the course of removing the Chairman. This means the Chairman works and gives decisions at the pleasure of the Minister who is also a renewing master of his tenure. He cannot be confident of not being punished by giving what the executive feels is a wrong decision. This in itself may be a sign of a compromised impartiality which may lessen confidence to these bodies particularly when it is land conflict between the government and its people. The position is the same to the Ward Tribunal and the Village Land Council save for the High Court of Tanzania and the Court of Appeal of Tanzania where security is well documented. These as well are limited in accessibility due to the original jurisdiction thereto of which its jurisdiction has to be established by the valuation report. Yet its accessibility is questionable in terms of pecuniary jurisdiction in the absence of the valuation report.

Selection of Writings and Speeches, 1st Ed. Oxford University Press, Dar Es Salaam, p. 261 and 131

186 See what is taking place in Tindiga Ward in Kilosa; Mkindo Ward in Mvomero through Mwano groups to mention a few

187 See Section 28 of Act No. 2 of 2002

1.6 Position of Assessors and the process of securing them

The Courts of law always sit with assessors particularly at the District Land and Housing Tribunal. The opinion of wise assessors assists the umpire to give his decision. In case he does not accept their opinion reasons shall be advanced. Similarly, it is now a requirement that assessors must sign a judgment as it is to the chairman to show that they agree with the issued judgment. Sitting with assessors for the purpose of this paper is not in dispute. What puts doubt is how the assessors are obtained. The Law provides that, the Minister upon consulting the Regional Commissioner may appoint not more than seven assessors three of whom shall be women. With development of multiparty democracy, the parties to the proceedings may not feel comfortable to present their cases as there might be likelihood of bias by the person who does not belong to the party in power. This is because, the Regional Commissioner of whom the Minister consults in the course of appointing assessors belonging to the ruling party. This is so presumed on a reason that the law does not put it a mandatory requirement as it is to criminal cases for the parties to object to any of the presiding assessors.

There is nowhere, it is provided that assessors shall undergo a scrutiny from the grass root of which villagers may through their voices in their respect Districts air their interest in the course of appointing these assessors.

The reason for doubt in this context is not an imaginary thing. Mirindo puts it loud that, it is a rule of practice now accepted as part of the procedure for a fair justice administration basing on the right to a fair hearing. It is in such instance deemed a condoning factor to justice.

It is not in dispute that the so properly appointed assessors may not do justice but the principle against bias reasons it out beyond this notion. The case of R v H.M Coroner for Inner West London ex parte Dallaglio and Lockwood Crof, it was held by Simon Brown, LJ, among other things, that, ‘...injustice will have occurred as a result of bias if the decision-maker unfairly regarded with disfavor the case of a party to the issue under consideration by him’. ‘Unfairly regarded with disfavor’, meant was pre-disposed or prejudiced against one party’s case for reasons unconnected with merits of the case...

Meanwhile, in Tanzania jurisprudence, it is a settled principle that the rule against bias is well documented. Kalebeye J while making reference to Gough case (cited herein above), cemented for a test of bias with a principle that justice must not only be done but seem to be done. On the other hand, Fauzi, J, in the case of Independent Power Tanzania Limited and Another Vs Standard Chartered Bank and 2 Others, has set an emphasis that bias is likely to be seen when there is inability to the trial judge to adjudicate without consideration of extraneous matter, prejudices or predilection.

Now, the procedures for obtaining the said assessors seems to condone injustice to the majority on the ground of bias, thus in most cases a self help becomes a remedy than resorting to these Courts. The process of obtaining the assessors to be brief does not emanate from the villagers themselves. It seems impulsive. Their security of tenure as well is questionable.

1.7 Procedural Technicalities

In Tanzania it is well settled that rules of procedure are handmaiden of justice and thus must not be used to thwart substantive justice. This as well has been the position in the course of administering justice with land settlement machineries. It has gone further that machineries like the Ward Tribunals are not bound by rules of evidence or procedure applicable to any court. However, while it is so accepted, its application has not


201 Independent Power Tanzania Limited and Another Vs Standard Chartered Bank and 2 Others, Civil Case No. 60 of 2014, High Court of Tanzania at Dar Es Salaam delivered on 27th May 2016; See also VIP Engineering and Marketing Ltd Vs Standard Chartered Bank PLC and 5 Others, Civil Case No. 229 of 2013 High Court of Tanzania at Dar Es Salaam and Luxury Apartment Limited v Edward Wilson Ngwale, Misc. Civil Application No. 59 of 2013 High Court of Tanzania at Dar Es Salaam; See also the position in IPTL Vs VIP Engineering and Marketing Limited (2004) T.R.L 373; Zabron Pangamaleza Vs Joakim Kiwaraka and Another (1987) T.L.R 140.

202 See Article 107 A (2) (e) of Cap. 2 R.E 2002; The National Housing Corporation Vs Etienne, Civil Application No. 10 of 2005, CAT at DSM (Unreported) ; DT. Dobie (T) Ltd Vs Phantom Modern Transport (1985) Ltd, Civil Application No. 141 of 2001, CAT (Unreported) ; Julius Ndyanabo Vs AG, Civil Appeal No. 64 of 2001, CAT at DSM; Cropper Vs Smith (1884) 26 CL.D.700 at p. 700; General Marketing Co. Ltd Vs A.A. Sheriff (1980) T.L.R 61 p.65; Manji Ltd Vs Arusha General Stores (1991) TLR 165, Rawal Versus Mombasa Hardware (1968) E.A 392

203 See Section 15 (1) of the Ward Tribunal Act, Cap. 206 R.E 2002, See also Regulation 10 of the Land Disputes

194 See Section 26 of Act No. 2 of 2002 See also Regulation 33, 34 of the Land Disputes Courts(The District Land and Housing Tribunal Regulations, 2003, GN.No. 174 of 27/06/2003

195 See the case of Neli Manase Foya Vs Damian Mlinga Civil Appeal No. 25 of 2002 Court of Appeal of Tanzania(Unreported)

196 See Section 26 of Act No. 2 of 2002

197 See the case of Lauret Salu and 5 Others Vs R Criminal Appeal No. 176 of 1996 CAT at Mwanza(Unreported)

198 Mirindo, F., (2014), Administration of Justice in Mainland Tanzania, 1st Ed. Dar Es Salaam, Law Africa (T) Ltd. p.395; See also the case of Bundala Mihayo and Another Vs R Criminal Appeal No 137 of 1991 CAT at Mwanza issued in 1992(Unreported)

199 R v H.M Coroner for Inner West London ex parte Dallaglio and Lockwood Crof,[1994]4 All E.R 139; see also R V Gough, A.C. 646

200 See Article 107 A (2) (e) of Cap. 2 R.E 2002; The National Housing Corporation Vs Etienne, Civil Application No. 10 of 2005, CAT at DSM (Unreported) ; DT. Dobie (T) Ltd Vs Phantom Modern Transport (1985) Ltd, Civil Application No. 141 of 2001, CAT (Unreported) ; Julius Ndyanabo Vs AG, Civil Appeal No. 64 of 2001, CAT at DSM; Cropper Vs Smith (1884) 26 CL.D.700 at p. 700; General Marketing Co. Ltd Vs A.A. Sheriff (1980) T.L.R 61 p.65; Manji Ltd Vs Arusha General Stores (1991) TLR 165, Rawal Versus Mombasa Hardware (1968) E.A 392

203 See Section 15 (1) of the Ward Tribunal Act, Cap. 206 R.E 2002, See alsoRegulation 10 of the Land Disputes
get rid of the use of procedural requirement of the law. In the case of *William Stephen Vs Ms Leah Julius* 204 the Court was of the view that, ‘...Substantative justice as enshrines under ....Constitution of the United Republic of Tanzania does not, in our considered view, do away with the need to observe procedural requirement of the law. Doing so may result in causing injustice...Ignoring such irregularities amounts to condoning injustice...’

To a lay person who is in most cases unrepresented would feel that justice is done if our tribunals are free from legal technical issues in favour of a substantive justice. It is common that a judgment at a ward tribunal is reduced down in Swahili language but its application for execution is lodged at the District Land and Housing Tribunal (DLHT) which often than not is far away from the Ward Tribunal. As if it is not enough, an application for execution and appeals are filled in English. Similarly the law governing these tribunals is reduced down in English as if all the villagers are trained to know and speak English. This barrier may not encourage the litigant or the villagers to access these machineries. Likewise, the proceedings at the DLHT are recorded in English.

It may not be difficult at the Ward Tribunal to access the Court, but in case the subject matter exceeds the jurisdiction of the Court, it is where hardship commences. 205 The District Land Housing Tribunal can only be accessed by filing forms in English as they are shown under the Land Disputes Courts (The District Land and Housing Tribunal Regulations, 2003, GN. No. 174 of 27/06/2003. Applications in terms of chambers summons and affidavit are lodged in English and in case of any gap the Civil Procedure Code and the Evidence Act applies. 206 This is where technical issues lie and it is doubtful if the same are at the finger tips of the unrepresented persons.

Going by the same logic that legal technical procedures are not allowed, there is no law that has been enacted to guide the litigants from the Ward Tribunal and District Land and Housing Tribunal appealing to the High Court and thereafter appealing to the Court of Appeal. They are subjected to entire Court proceedings under the Appellate Jurisdiction Act and the Court of Appeal Rules, 2009. Through this mechanism, land disputes may not come to a halt. Living example are not far to trace in this sense. In Morogoro Region particularly, Kilosa there has been a matter that has not come to a halt. Long, yet disputes over the area have not come to a halt yet. Villagers are still reported to have been in serious fights which at the past eight months from the appointment.

Another good example, has been in Mvomero within Mkindo Ward where a suit has been lodged at the District Land and Housing Tribunal of Morogoro and has been decided to its finality but yet still the land dispute has not come to at halt. This was the case between *Kambala Village Council Vs Jaribu Mwishee and 19 Others,* 208 where later on the Villages of Mkindo, Dihombo, Kigugu and Hembeti joined the proceedings. The applicant’s claim was that Kambala village be declared the sole registered owner of the village suit land and for the order that the Respondents be evicted from the suit land and perpetual prohibition against the Respondents not to invade the suit land. Despite the rue fact from the records that the suit dragged in Court for almost ten years, possibly with good cause, the existing records show that the area in dispute that is bogo suburb, commonly known as Mgonogola basin was situated at Kambala village. 206 The decision of the District Land and Housing Tribunal was issued on 02/06/2015, among other things, nullifying the certificate of village land of Kambala, No. 006 MVDC and ordering for verifying boundaries of the villages and establishment of buffer zone of seventy meters wide to separate the farm land from the pastoral areas through permanent beacons demarcating the area. From the time, the decree was so issue, there was efforts employed by the Applicants to appeal and staying the execution of the decree at the High Court of Tanzania at Dar Es Salaam but the an application for stay was not sustained thus struck out on 03/11/2015. But an appeal is still pending at the High Court of Dar Es Salaam.

Despite having such a dispute dragged in Court for such long, yet disputes over the area have not come to a halt yet. Villagers are still reported to have been in serious fights which at the first instance do not show any greenlight of finally resolving the matter.

V. CONCLUSION

The efforts employed by the Government to make sure that land disputes are settled through right machineries are highly appreciated. However, I am at one with what Mwalimu Nyerere once said at his first inaugural Address to the Parliament in

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204 *William Stephen Vs Ms Leah Julius Civil Appeal No. 65 of 2013 CAT at Arusha*

205 See 2nd Schedule Forms No. 1,3, of the Land Disputes Courts(The District Land and Housing Tribunal Regulations, 2003, GN. No. 174 of 27/06/2003

206 See Section 51 of the Land Disputes Courts Act, No. 2 of 2002

207 *Halmashauri ya Kijiji cha Mabwegere Vs Hamis (Shaban ) Msabaha and 32 Others, Civil Appeal No. 53 of 2010 , CAT, Dar Es Salaam*

208 *Kambala Village Council Vs Jaribu Mwishee and 19 Others, Application No. 127 of 2005 the judgment of which was delivered on 6th day of June 2015*

209 See Government Notice No 301 of 22/08/2014

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1962 which among other things, emphasized that we cannot hope to solve our problems by pretending that they do not exist.210

The land disputes in Morogoro Region are acknowledged to have been in existence.211 What is important here is to see whether these machineries set-forth to settle these disputes serve the purpose either from the personal angle of an individual exercising this noble duty to Institutional view.

It is not the purpose of this paper to give a conclusive position on whether these machineries may be one of the sources for land disputes or accelerated land disputes but rather highlighting possible issues from the legal point of view that may either thwart accessibility to these machineries in express or implied terms.

REFERENCES


AUTHORS

First Author – Sigsbert Ngemera, Assistant Lecturer, The Open University of Tanzania, Diploma in Education (Mwpawpa Teachers’ College Tanzania), LL.B (Hons), PGD Legal Practice (Law School of Tanzania), LL.M (Civil Procedure) OUT, Ph.D Candidate, Mzumbe University Tanzania, (Land Law), Advocate of the High Court of Tanzania and Subordinate Courts thereto save for Primary Courts, Partner MNL Law Chambers, Dar Es Salaam and a Member of the East African Law Society.
With the increasing mobility of people and goods, the time will come when they demand transportation services with higher level of safety, security, speed, smoothness and comfort. If a transportation company or a certain form of transportation always provides services with quality that satisfies the users, the consumers will become loyal customers. Good quality of the services will increase a company’s image in the customers’ eyes. Ferry ports are vital when it comes to distribution of goods or people from one place to another. Because ferry ports are places where people shift, port areas are strategic places to extend businesses. Economic development needs transportation services that are adequate and sufficient. Without transportation as the supporting tools, we cannot expect good results in terms of the economic development of a nation. A strategy is a plan that is designed to reach targets and goals. Planning is an organization’s anticipation, what needs to be done in order to reach the goals. The purposes of this research are (1) To identify the segmentation of the passengers of Merak Ferry Port, (2) To analyze the passengers’ level of satisfaction regarding the various services business of Merak Ferry Port and (3) To analyze and formulate the proper various services business strategy to be implemented. The research method that is used is descriptive tabulation which is a statistic analysis process that includes attempts to investigate and reveal information that is relevant that the data contains. Analysis Cluster is used to reduce the data in the research into clusters. The purpose is to show the differences among the clusters created and unite the similarities based on the data achieved. Importance Performance Analysis as an indicator of the quantitative measurement scale for level of importance based on the customers’ perception and level of performance in real of a product is expressed in a form of consumers’ response regarding satisfaction in the form of Likert scale. This scale allows the respondents to express the identity of their feelings about a product’s characteristics by deciding the score of every indicator from variables X and Y, by shifting the whole data frequency with the weight.

Keywords: segmentation, consumers’ satisfaction, business strategy, Importance Performance Analysis, Analysis Cluster

I. INTRODUCTION

The water transportation sector, which includes ports and ships, has a role in connecting an island with another island so that the economic activities can be run smoothly. Besides that, the water transportation sector also has a role in supporting the economic growth of underdeveloped regions and as a tool that supports the economy of developing regions. In other words, transportation has a role in triggering the dynamic of the development through the mobility of people, goods and services as well as supporting the national distribution pattern. With the increase of the mobility of people and good, the time will come when people demand transportation services with higher level of safety, security, speed, smoothness and comfort. If a transportation company or a certain form of transportation always provides services with quality that satisfies the users, the consumers will become loyal customers. Good quality of service will make the company’s image better in the eyes of the customers.

Ferry ports are vital in the distribution of goods and people from one place to another. Because ferry ports are places where people shift, port areas are strategic places to extend businesses. Economic development requires transportation services that are adequate and sufficient. Without transportation as the supporting tools, good results in the attempts to develop the economy of a nation cannot be expected. In order to develop a nation’s economy, optimal transportation capacity is needed. However, we need to consider the fact that the determination of the capacity and the level of investment are not easy. PT ASDP is a company that runs in the field of transportation and ferry ports. Ferry ports are divided into two, which are commercial ferry ports and pioneering ferry ports. Commercial ferry ports are ports that receive benefits from their business. Merak Port is the busiest ferry port in Indonesia. The data regarding the production of passengers of Merak Ferry Port can be seen in Table 1:

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Children</td>
</tr>
<tr>
<td>2011</td>
<td>1.358.927</td>
<td>126.143</td>
</tr>
<tr>
<td>2012</td>
<td>1.414.155</td>
<td>130.786</td>
</tr>
<tr>
<td>2013</td>
<td>1.486.127</td>
<td>137.351</td>
</tr>
</tbody>
</table>

www.ijsrp.org
PT ASDP is tasked by the government to be the operator of ferry ports and one of the operators of the ferries that operate in Merak Port. The number of ferries owned by PT. ASDP increases every year, but the data of the passengers who use PT. ASDP’s ferry services is not in line with the addition of the ships. In terms of the number of passengers, there is an increase, but if it is compared to the increasing number of ships, then there is a decline in the number of passengers. The data regarding the production of the passengers of Merak Ferry Port can be seen in Table 2.

Table 2 The data regarding the passengers of the ships of ASDP in Merak Port in years 2011 until 2015

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Passengers</th>
<th>Number of Ships</th>
<th>Average per ship</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>312.487</td>
<td>3</td>
<td>104.162</td>
</tr>
<tr>
<td>2012</td>
<td>295.856</td>
<td>3</td>
<td>98.619</td>
</tr>
<tr>
<td>2013</td>
<td>266.374</td>
<td>4</td>
<td>66.594</td>
</tr>
<tr>
<td>2014</td>
<td>323.528</td>
<td>6</td>
<td>53.893</td>
</tr>
<tr>
<td>2015</td>
<td>314.528</td>
<td>9</td>
<td>34.948</td>
</tr>
</tbody>
</table>

PT. ASDP as the operator of the ferry ports owns the port areas that can be used to extend their business. Business in the provision of port services to create benefits in order to enhance the value of the company by applying the principles of limited companies. There are various port services business that manages businesses in both ports and ferries. However, the various services business is currently operating in the ports only.

Based on the background and the problem formulation above, the purposes of this research are (1) to identify the segmentation of the passengers of Merak Ferry Port, (2) to analyze the passengers’ level of satisfaction regarding the various services business of Merak Ferry Port and (3) to analyze and formulate the proper various services business strategy to be implemented.

II. RESEARCH METHOD

The determination of the respondents is done using the non-probability sampling which uses that convenience sampling. Convenience sampling is a sampling technique that uses the elements that are easy to be contacted, recognized and willing to cooperate in accordance with the criteria in the research.

This research includes primary data which is the data that acts as the main source of information in answering the purposes of the research. Besides that, secondary data is also needed, which is the data that acts as complement to the main data in answering the purposes of the research. There are 2 data sources which are (1) Primary Data which includes the passengers’ behaviors, passengers’ demography, passengers’ satisfaction and benchmarking data received from the results of questionnaires distributed to the passengers and interviews with the company. (2) the secondary data includes the company profile, the number of passengers and the number of business production received from the company’s documents.

The population of the research is all of the passengers of Merak Ferry Port and the passengers of the ferries owned by PT ASDP in Merak Ferry Port in 2015 whose age was 17 or above. The sampling for the research refers to the following Slovin Formula:

$$n = \frac{N}{1 + Ne^2}$$

Note:
- \(n\): number of samples
- \(N\): number of population
- \(e\): limit for error tolerance

The data analysis of this type of research is quantitative and qualitative descriptive, which identify the problem using analysis measurement tool and field observation. The data collected in the data collection phase needs to be processed first, in order to simplify the whole data collected and presented in a good and neat arrangement to be analyzed afterwards. Data processing is needed to translate the numbers received from the research results.

The data processing methods used in this research are:
1. Descriptive tabulation is an statistical analysis process that includes attempts to investigate and reveal relevant information contained in the data,
2. Cluster Analysis is used to reduce the data in the research into clusters. The purpose is to show the differences among the clusters created and unite the similarities based on the data received,
Index Performance Analysis as a quantitative measurement scale indicator for level of importance based on the customers’ perception and level of performance in real of a certain product expressed in the form of consumers’ response regarding satisfaction in the form of Likert scale. This scale allows the respondents to express the identity of the respondents’ feelings regarding the characteristics of a certain product by determining the total score of every indicator from variables X and Y, by shifting the whole data frequency with the weight (Simamora, 2004).

Table 3 Weight value from the respondents’ answers

<table>
<thead>
<tr>
<th>Performance Option</th>
<th>Weight</th>
<th>Importance Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>5</td>
<td>Very Important</td>
</tr>
<tr>
<td>Good</td>
<td>4</td>
<td>Important</td>
</tr>
<tr>
<td>Adequate</td>
<td>3</td>
<td>Quite Important</td>
</tr>
<tr>
<td>Poor</td>
<td>2</td>
<td>Not Important</td>
</tr>
<tr>
<td>Very Poor</td>
<td>1</td>
<td>Not Important at all</td>
</tr>
</tbody>
</table>

Next, the total weight is divided by the number of respondents, the result is the mean of the weight (X) for performance and the mean of the weight (Y) for importance. In the simplification of the formula, then for every end of a factor that influences satisfaction with:

\[
\bar{X} = \frac{\sum X_i}{n} \quad \bar{Y} = \frac{\sum Y_i}{n}
\]

Where:
- \( X \) = The average value of the performance level of the i attribute
- \( Y \) = The average importance of the i attribute
- \( \sum X_i \) = The total score of the performance level of the i attribute
- \( \sum Y_i \) = The total score of the importance level of the i attribute
- \( N \) = The number of consumers’ data

Making a Cartesian diagram which is a form that is divided into four parts confined by two lines that intersect perpendicularly with the (X,Y) spot where X is the mean of the average score of the level of importance of the whole importance factors. Next, the level of the elements will be elaborated and divided into four parts into a Cartesian diagram as seen in the figure below:

Figure 1 IPA Cartesian Diagram

Customer Satisfaction Index

First, determining the Mean Importance Score (MIS). This value comes from the average importance of every consumer.
Where:

\[ n = \text{Number of consumers} \]
\[ Y_i = \text{Importance score of the } i \text{ service product} \]

Second, making the Weight Factors (WF). This weight is the MIS value percentage per service product on the total MIS of all the service products.

\[ WF = \frac{MIS_i}{\sum_{i=1}^{p} MIS_i} \times 100\% \]

Where: \( p = \text{the } p \text{ importance service product} \)

Third, making the Weight Score (WS). This weight is the multiplication between WF and the mean satisfaction score (X) (MSS)

\[ WS_i = WF_i \times MSs \]

Fourth, determining Customer Satisfaction Index (CSI)

\[ CSI = \frac{\sum_{i=1}^{p} WS_i}{HS} \times 100\% \]

Where:

\( p = \text{the } p \text{ importance service product} \)
\( HS = \text{(Highest Scale) The maximum scale used} \)

The range of the customers’ satisfaction is between 0 and 100 percent. The scale range formula used is based on Simamora (2004) which is as follows:

Based on the scale range above, the satisfaction criteria used in this research is:

<table>
<thead>
<tr>
<th>Satisfaction Scale Range</th>
<th>Satisfaction Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0%) &lt; CSI &lt; (20 %)</td>
<td>Very Dissatisfied</td>
</tr>
<tr>
<td>(20%) &lt; CSI &lt; (40%)</td>
<td>Dissatisfied</td>
</tr>
<tr>
<td>(40%) &lt; CSI &lt; (60%)</td>
<td>Quite Satisfied</td>
</tr>
<tr>
<td>(60%) &lt; CSI &lt; (80%)</td>
<td>Satisfied</td>
</tr>
<tr>
<td>(80%) &lt; CSI &lt; (100%)</td>
<td>Very Satisfied</td>
</tr>
</tbody>
</table>

The attribute of passengers’ satisfaction regarding the miscellaneous services business of Merak Ferry Port used in this research consists of 26 attributes. The determination of these attributes is done using the judgment method that is based on the dimension of the quality of services in previous researches and input from the representatives of the Merak branch of PT ASDP.

### III. RESEARCH RESULTS

**Merak Port Passengers’ Demography Segmentation**

Segmentation of the passengers of Merak Port is meant to facilitate the administrators in determining the priorities in designing a marketing strategy for the port’s service business. In this research, the division of passengers segments is done using the analysis tool of Agglomerative Hierarchical Clustering (AHC), where the number of groups formed from the passengers is still unknown.

Based on the data and information received, the passengers of Merak Ferry Port are demographically divided into two groups whose grouping variables include age, marital status, residency, education, occupation, income, ferriage purpose, ferriage frequency, ferriage partners, number of ferriage partners and reasons for using ships for transportation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group 1</th>
<th>Group 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18 – 30 Years old</td>
<td>&gt; 31 Years old</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Single</td>
<td>Married</td>
</tr>
<tr>
<td>Residency</td>
<td>Lampung, Palembang</td>
<td>Jakarta, Tangerang</td>
</tr>
<tr>
<td>Education</td>
<td>Non-Scholar</td>
<td>Bachelor</td>
</tr>
<tr>
<td>Occupation</td>
<td>Students / College Students,</td>
<td>Government Employees,</td>
</tr>
<tr>
<td></td>
<td>Private Employees</td>
<td>Employees of State-owned</td>
</tr>
<tr>
<td>Variable</td>
<td>Group 1</td>
<td>Group 2</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Personal Purposes</td>
<td>Work Purposes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Enterprises, Enterpreneur</td>
</tr>
<tr>
<td>Income</td>
<td>&lt; 1 million – 3 million</td>
<td>&gt; 3.1 million</td>
</tr>
<tr>
<td>Ferriage purpose</td>
<td>Family business, vacation</td>
<td>Official travel/business trip and business</td>
</tr>
<tr>
<td>Ferriage frequency</td>
<td>&lt; 3 times</td>
<td>3 times – 5 times</td>
</tr>
<tr>
<td>Ferriage partners</td>
<td>Alone, Family members</td>
<td>Work partners, Business partners</td>
</tr>
<tr>
<td>Number of ferriage partners</td>
<td>1-2 people</td>
<td>3 people - 10 people</td>
</tr>
<tr>
<td>Reasons for using ships</td>
<td>Sea views, Ticket price</td>
<td>The destination is close, The complete facility</td>
</tr>
<tr>
<td>Group members</td>
<td>52 people</td>
<td>48 people</td>
</tr>
</tbody>
</table>

**The Personal Purposes Segment**

Based on the data above, 52% of the passengers of Merak Ferry Port and the ferries owned by PT ASDP belongs to the first group, which are the passengers who, on the average, are 18-30 years old, single, reside in Lampung-Palembang, non-scholars (only went to Elementary Schools, Junior High Schools, High Schools and Diploma), Students/Scholars and Private Employees. This group tends to undergo ferriage for family business and vacation for less than 3 times a month. When they travel, they generally go alone or with their family members. The sea views and the affordable ticket price are the reasons why this group uses ferries. This group has a proportion that is bigger than the other group (52 people). Based on the profile of this passenger group, the writer uses the term personal purposes segment. The use of the term personal purposes is based on the approach of the passengers’ characteristics which tend to have the affordable ticket price as the reason. Family business and vacation as the reasons behind the travel are the reasons why the term is used.

**Work Purposes Segment**

48% of the Merak Ferry Port passengers and the ferries owned by PT ASDP belongs to the second group, which is the passengers who, on the average, are above 30 years old, are married, reside in Jakarta-Tangerang, have a degree (Bachelor, Master, Doctoral) and work as employees in state-owned companies, government companies and entrepreneurs. This group tends to travel for official travels and business trips for less than 3-5 times a month. When they travel, they are generally accompanied by their business partners and work partners. Close destinations and complete facilities are the reasons why this group use ships to travel. This has a smaller proportion when compared to the other group (48 people). Based on the profile of this passenger group, the writer uses the term of work purposes. The use of the term work purposes segment is based on the approach of the passengers’ characteristics which tend to have official travels and business trips as their reasons for traveling.

**Level of Importance and Passengers’ Satisfaction Importance-Performance Analysis**

Research is done on the dimension of the quality of the services of Merak Ferry Port and the ferries owned by PT ASDP using Importance Performance Analysis to see the level of performance and importance of the dimension of quality of services. Importance Performance Analysis (IPA) is started by measuring the conformity by mapping it into a Cartesian diagram. Mapping it into a Cartesian diagram is meant to figure out which service dimension variables are included in the main priorities, maintained, low priorities and excessive. The results of this research are expected to become suggestions for the company in making policies, especially ones that are related to the service dimension discussed in this research. The research is done to 100 passengers who undergo ferriage in Merak Ferry Port and uses the ferries owned by PT ASDP using the 26 attributes asked in the questionnaire for the passengers.

The results of the research is featured in the Cartesian diagram for all the passengers who undergo ferriage in Merak Ferry Port and use the ferries owned by PT ASDP.
Customer Satisfaction Index (CSI) Analysis

Consumers’ satisfaction is consumers’ happiness or disappointment achieved by comparing their impression regarding the performance of a product/service and their expectations regarding the performance of the product/service. If the reality is equal to or exceeds the expectations, then the consumers will be satisfied. On the contrary, if the consumers feel that the reality is not good enough, there will be dissatisfaction.

In this research, the level of passengers’ satisfaction in Merak Ferry Port is 64,05%. A Customer Satisfaction Index value that is this high belongs to the satisfied category. This indicates that the passengers of Merak Ferry Port are satisfied with the service performance of Merak Ferry Port, even though there are some attributes that need to be improved by the management party. The service attribute that needs to be improved in the future can be seen from the mapping results of each service attribute with the Importance Performance Analysis method.

Benchmarking Analysis

Benchmarking is a process of comparative study and measuring an activity of a company/organization on the best operational process in its class as an inspiration in enhancing the performance of a company/organization. This benchmarking analysis uses competitive benchmarking which provides a comparison of the competitors of a specific product or service. The purpose of this benchmarking is to determine the key of success of the strongest competitors, and then to adapt and improve it to make it better to apply. The companies used for the benchmarking are similar companies that have better services.

Table 6 Benchmarking results

<table>
<thead>
<tr>
<th>DATA</th>
<th>DESCRIPTION</th>
<th>ABCD</th>
<th>ASDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilets’ hygiene in ships (D10)</td>
<td>Standard Operating Procedure regarding Toilet Management</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Employees maintain toilets’ hygiene in accordance with the Standard Operating Procedure</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Employees’ concern regarding the toilets’ hygiene</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Employees’ responsiveness and quickness in responding to passengers’ complaints (D18)</td>
<td>Standard Operating Procedure regarding Employees’ Services to Passengers</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Implementation of standard operating procedure by Employees</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Employees’ performance evaluation regarding the service to passengers</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Convenience of passengers’ seats in ships (D9)</td>
<td>Standard Operating Procedure regarding passengers’ seats</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Employees ensure that the seats are in accordance with the standard operating procedure</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Employees’ quickness in repairing damaged seats</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>The coolness of air conditioners in ships (D11)</td>
<td>Standard Operating Procedure regarding air conditioners in ships</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>All rooms in ships have had air conditioners</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>DATA</td>
<td>DESCRIPTION</td>
<td>ABCD</td>
<td>ASDP</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td></td>
<td>Employees’ quickness in repairing or replacing damaged air conditioners</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Standard Operating Procedure regarding employees’ treatment to passengers in relation with social status, respect and politeness</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Employees treat all the passengers regardless of their social status</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Petugas memberlakukan penumpang dengan hormat dan sopan</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Employees provide information regarding the ships to the passengers</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

**Importance-Performance Analysis of the Segment of Personal Purposes**

The following are the results based on the segment of personal purposes that have the ferriage purposes of doing family and vacation activities. Service quality dimension of Merak Ferry Port Services by using Importance Performance Analysis to see the level of performance and importance of the service quality dimension.

![Figure 2](image)

**Customer Satisfaction Index (CSI) Analysis of the Personal Purposes**

Consumers’ satisfaction is consumers’ happiness or disappointment received by comparing their impression regarding the performance of a product/service and their expectations regarding the performance of the product/service. If the reality is equal to or exceeds the expectations, the consumers will be satisfied. In this research, the passengers’ level of satisfaction in the personal purposes segment in Merak Ferry Port is 65.1943%. A Customer Satisfaction Index value this high belongs to the satisfied category. This indicates that the passengers in Meraj Ferry Port are satisfied with the services of Merak Ferry Port, even though there are some attributes that need to be improved by the management party.

**Importance-Performance Analysis of the Work Purposes Segment**

The following are the results based on the work purposes segment that have the ferriage purposes of doing official travels and business trips. A research is done on the service quality dimension of the Services of Merak Ferry Port by using Importance Performance Analysis to see the level of performance and importance of the service quality dimension. Importance Performance Analysis (IPA) is started by measuring the conformity by mapping it into a Cartesian diagram. Mapping into a Cartesian diagram is
meant to figure out which service dimension variables are included in the main priorities, maintained, low priorities and excessive. The results of this analysis are expected to become suggestions for the company in making policies, especially the ones related to the service dimension variables discussed in this research.

![Figure 3 The results of the IPA analysis on the attributes of the Work Purposes Segment](image)

**Customer Satisfaction Index (CSI) Analysis of the Work Purposes**

Consumers’ satisfaction is consumers’ happiness or disappointment received by comparing their impression regarding the performance of a product/service and their expectations regarding the performance of the product/service. If the reality is equal to or exceeds the expectations, the consumers will be satisfied. On the contrary, if the consumers feel that the service is not good enough, there will be disappointment.

In this research, the level of satisfaction regarding the Work Purposes passengers segmentation in Merak Port is 62.810%. A Customer Satisfaction Index value this high belongs to the satisfied category. This indicates that the passengers of Merak Port are satisfied by the performance of Merak port’s services, even though there are some attributes that need to be improved by the management party. The service attributes that need to be improved in the future can be seen in the mapping results of each service attribute using the Importance Performance Analysis method.

**IV. CONCLUSION**

There are two segments in the identification results of the segmentation of passengers in Merak ferry port which are personal purposes and work purposes. The use of the term work purposes is based on the approach of the passengers’ characteristics that tend to undergo ferriage for the purposes of official travels, office trips and business activities. This group tends to work as government employees, state-owned enterprises employees and entrepreneurs. When they travel, they are generally accompanied by their office mates and work partners.

In this research, the level of satisfaction of all the passengers who undergo ferriage in Merak Ferry Port and use the ferries owned by ASDP is 64.05%. A Customer Satisfaction Index value this high belongs to the satisfied category. This indicates that the passengers in Merak Ferry Port and the ferries owned by ASDP feel satisfied by the performance of the services provided, even though there are attributes in the main priorities that need to be improved by the management party. The level of satisfaction of passengers in the personal purposes segment whose reasons for traveling are family issues and vacation purposes is as much as 65.19% and the level of satisfaction of the passengers from the work purposes segment whose reasons for traveling are work purposes and business purposes is as much as 62.81%. Passengers with the work purposes segment have the lowest level of satisfaction when compared to the satisfaction of the segment with personal purposes and the satisfaction of the whole passengers.

The correct business development strategy in Merak Ferry Port and the ferries owned by ASDP to be done in order to enhance the number of passengers who undergo ferriage is ensuring the hygiene of the toilets of the ships and the port, the availability and the conformity of the information and the facilities in the port and the ships. Besides that, the employees who are in the ships and the port must enhance their services and be quick in responding passengers’ complaints as well as ignore the passengers’ status. With
the existence of the segments of personal purposes and work purposes, the strategy that needs to be done by the company is ensuring all the available facilities in the port and the ships operate well and adding facilities for both segments in order to enhance the company’s income and enhance the passengers’ convenience. For the personal purposes segment, the company can provide facilities that can be enjoyed by families and facilities that support passengers in enjoying tourism activities in SelatSunda. For the work purposes segment, the company can provide facilities that bring convenience and do not decrease the office and business activities in enjoying the ferriage by providing rooms that completed with good internet connection and equipment which can make the ferries comfortable places to do office and business activities. They can also ensure that all the employees perform the standard operating procedures that have been made by the management party nicely so that the service to the passengers can bring comfort, safety as well enjoyment in undergoing ferriage using the ferries owned by ASDP.

**BIBLIOGRAPHY**


**AUTHORS**

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Teaching with games

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Abstract - Teachers usually find a difficulty to create new ways on teaching a language. This is because not all ways effect on students and attract them to learning. The researcher’s focus will be mainly on how teaching by playing effect on learning process and if teachers are using playing games in teaching. This research is a case study on some teachers majoring in English were given a survey to answer, and their responses were gathered and analyzed in this study.

Index Terms - Exploitation, Energy, Activity, Directed, Undirected, Entertainment, Organism, Intended, Intensively, Guided play, Unguided play, Imagination, Educational games, Cooperation, Membership, Self confidence, Abilities, Games psychomotor, Games representative, IQ Games

I. Introduction

As we know the hers to use new ways that attract huge change that happened on the world and the students' attentions force teachers to use new ways in teaching which attract students to learn and make the learning process working easily with the world's need.

One of the newest ways is teaching by games, especially with those students who are in classes 1-4. Games make them more active to learn and they will be happy because they are doing what they like and at the same time teachers will achieve their aims to make them received the information on attractive way.

Some teachers don't like to use this way because they think that will wise their time and they just want to finish the class and gave what is in the book.

Aims of the Study:

This study may be important for teachers in general and English teachers in particular. It is meant to raise teachers' awareness on the rigid ways that they in teaching and try to improve them.

Problem Statement:

Many English teachers face a difficulty in finding a good ways when they teach a young students. This refers to what students attract on and what they want to learn and how they like to receive the information.

Scope of Study:

This study covers a significant sample of English teachers. It proposes a survey; six questions were given to 10 teachers to answer them.

Hypothesis:

This study hypothesizes that teachers have problem in choosing the best way and the suitable game that effect on students. For the sake of proving or denying the hypotheses, this study will focus on teachers' point of view.

Literature Review:

Playing is the exploitation of the energy and the mind at the same time through the activity. It can be either directed or undirected, carried out by children for fun and entertainment in a direct way.

And playing came in many forms, is a sort of free activity exercised by the organism automatic exercise is not intended to and behind only the fun of the exercise, which is instinctively inclined years and that different forms of age to another and from one community to another.

The benefits of learning by playing

Child reap several benefits from educational games including:

- It asserts itself through excellence on others individually and within the group.
- Learn cooperation and respect for the rights of others.
- Learn to respect the laws and the rules and abide by them.
- It enhances membership of the group.
- It helps in memory and thinking, perception and imagination growth.
- Gaining self-confidence and a reliable and easy to discover his abilities and tested.

Educational games types:

Dolls: such as hunting tools, cars, trains, brides, forms of animals, machines, Toiletry...Etc.

Games psychomotor, games throwing and tossing, installation, racing, jumping, wrestling, balance and swing, running, ball games.

IQ Games: like puzzles, problem-solving...k words.

Games representative: such dramas, role-playing games.

Singing and dancing games: singing representative, the tradition of songs, chants.

Games of Chance: dominoes, snakes and ladders, guessing games.
Stories and games Cultural: poetry competitions, express cards.

II. METHODOLOGY

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you support learning with playing?</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Do you receive promote to use teaching by game from supervision and the surrounding environment?</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Do you think that teacher use learning by playing in the materials that are taught?</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>When should teacher use learning by playing?</th>
<th>All lessons</th>
<th>Some lessons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Have teachers noticed a differences or improving in the performance of students with the use of learning by playing?</th>
<th>Improve students' performance</th>
<th>No change at all</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In case teachers do not use learning by playing, what is the cause of that?</th>
<th>Teachers does not have enough time</th>
<th>Teachers prefer teaching on traditional way</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

**Data Collection:**

The data collection of the case study in this research was done by distributing papers that included 6 questions for 10 teachers majoring in English education.
**q1: Do you support learning with playing?**

- Yes: 80%
- No: 20%

**q2: Do you receive promote to use teaching by game from supervision and the surrounding environment?**

- Yes: 40%
- No: 60%
Figure 3

q3: Do you think that teachers use learning by playing in the materials that are taught?

- Yes: 50%
- No: 50%

Figure 4

q4: When should teachers use learning by playing?

- Some lessons: 80%
- All lessons: 20%
q5: Have teachers noticed a differences or improving in the performance of students with the use of learning by playing?

- Improve students' performance: 90%
- No change: 10%

Figure 5

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q6: In case teachers do not use learning by playing, what is the cause of that?

- Teachers prefer teaching on traditional way: 40%
- Teachers does not have enough time: 60%

Figure 6
III. ANALYZING AND COMMENTS

Figure 1 shows that 80% of teachers said yes for the first question as they support learning with playing and about 20% of them said no.

Figure 2 shows that 40% of teachers received promote from supervision to use learning by game, 60% of them were disagree on that.

Figure 3 shows that half of the teacher think that teachers use learning by playing and the other half disagree.

Figure 4 shows that 80% of teachers said that teachers should use learning by playing in some lessons and 20% said they should do in all lessons.

Figure 5 shows that 90% of teachers have noticed that students performance improve when they use learning by playing, 10% said there is no changes.

Figure 6 shows that teachers didn't use this way in their lessons because there is no enough time for that and 60% were agree in that, and 40% said that teachers prefer traditional way in teaching.

IV. RECOMMENDATIONS

- Teachers must create a new ways on teaching.
- Teachers must find free time to use the new ways.
- Teachers must manage the class time limit to use different ways.
- Teachers must examine the game for the first time if it gave the aim of it or not.
- Teachers must test the students in what they learn from the game.
- Teachers must write for the principle to support them with the helping tools.

REFERENCES


AUTHORS

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Are kids mentally smart or are they smart because of technology?

Dr. Mousa Khaleel

UAE_ABUDABI_ALAIN

Abstract- This research report explores the influence of technology on smartness &cognitive development of children with analyzing the behavior of children with using the gadgets and advanced devices. This paper investigates whether the mental capabilities of children are due to use of technological equipment and tools or they have their abilities. This research uses mixed approach method questionnaire and survey approach with convenience sampling from 15 respondents three of them was selected for an interview. Results indicate that children are nowadays are moving towards the age where parents will make their children bounded with these technologies and limiting their thinking capabilities to solve the complex matters and issues that will surely make children dumb instead of making smarter.

Index Terms- Technology, Digital Age, Mental Development, Kids, gadgets

I. INTRODUCTION

Television was considered as the advanced technology that was in the homes that were later replaced by the videos and computers. In today world of advanced technology and sophisticated innovations, children are growing in an age that is titled as digital age, this digital age is rapidly growing and changing that is completely different from the age of the parents and ancestors of the children. Now, we are surrounded by a wide range of technologies not only in offices but in homes, markets, schools and healthcare too. New technology, advanced gadgets, and digital media support can be used for enhancing the learning process and gaining in-depth knowledge if it is utilized wisely. This advanced technology can be a source of optimizing the learning potential of children if children are engaged in enjoyable experiences. Not only learning process but also the development of children, relationship with peers and adults can also be fortified through using advanced technology(Simuforosa, 2013). As relying and depending more and more on advanced technology for the develop mail process of children it is leading towards over excessive use of gadgets by the children. It is not surprising for parents and the caretakers that children are becoming addictive users of these advanced technology gadgets.

Mobile phones and different advanced gadgets, instead of investing in the creative opportunities for the development of children, enhancing their learning process and supporting educational tasks, can be a source of increasing distraction and negative outcomes on the physical, mental and cognitive development of children(Subrahmanyam, Greenfield, & Kraut, 2001).

This research aims to find that whether children are affected by these modern technology tools and their smartness are because of this technology or they are smart mentally. This study emphasizes on gathering opinions of parents and caretakers to identify whether kids are mentally smart or are they smart because of technology.

II. LITERATURE REVIEW

Before the event when the children speak their first word, their brains are having an excessive amount of learning that is happened before they reach the age of five. Research connected to the University of Washington indicates that the advance gadgets are not of significance importance for the development of the children. Children can be involved in having communication with the society and reading of the books too. Instead of gadgets and advanced tools, children are required the time from their parents and having involvement of parents in their matters. Moreover, excessive exposure to gadgets results in deficient attention, delay in cognitive development and weak learning process(Costley, 2014).

Another problem that is identified by the researcher is that use of technological gadgets and devices can be a source of weakening the memory of children. A new generation of children is witnessing problems and issues in writing complete statements, sentences and paragraphs and spellings because they are involved in using text messages and internet slang.

Studies also put forward that when children are exposed towards different technological tools excessively, this result in creating distraction from the duration of quality sleep and therefore this will ultimately lead to poor performance in academics(Schacter, 2002).

Another study put forward that due to increased use of modern technologies, children can be accompanied by less amount of sleep and that will result in increase in difficulties to have attention towards academic performance. Laptops and palmtops are available in the market that had to attract the target market of young children that starts from the year of 3 to 4 years. Smartphones are available easily for the children for the age group of children from 10 to 12 years. According to a survey conducted by The Kaiser Family Foundation in 2010, children belong to the age group of 8-18 years old, spend their ten hours in average in front of the media and digital gadgets(Haughton, Aiken, & Cheevers, 2015).

Nature Conservancy, in a global survey, put forward that the throughout the globe, preschoolers spend only 12 hours in a week, playing outdoors or on a playground. Therefore, it should not be a fact of a surprise that when children will turn to the age
group of 7 to 10, the concept of traditional play will be over and they will be surrounded with the gadgets and the advanced tools. Advanced tools and techniques and devices, can also be a source of bringing advanced educational opportunities with creative work for children that can result in enhancing the knowledge of children. Different studies put forward that the benefits of using technology in schools can lead to establishing different projects that will involve students to think critically and solve the problems using their metal capabilities. Technology can be utilized to redesign and reframing the classrooms of the children that can produce that environment which will be helpful for promoting the development of skills in children for higher order level. Technology can also be a source of increasing student collaboration that is a highly effective tool for the learning process of children. Through utilizing technology children can work in groups that can be a source of learning from each other and working collaboratively. (Hatch, 2011)

Due to a rich body of research, now people are aware of the development process of children and therefore cutting – edge technologies and media are playing a significant role in creating awareness among parents and caretakers about applying the principles of development and learning of the children. Through the integration of technology in the childhood development programs, professionals are succeeded in creating solid developmental foundations for the children. It is important for the early childhood programme to improve the developmental program quality through identifying the opportunities and challenges of advanced technology that can affect the developmental process of children (NAEYC, 2013).

The benefits of traditional playing on the ground and outdoors are not limited to physical health and development of children but also it positively affects the mental, emotional and cognitive development of children. In contrast, the demerits of addictive to gadgets are huge that can affect the children until they reached their adulthood. It is important for parents and guardians of children, before handing over gadgets to their child, to have in-depth emphasize on the long-term effects of advanced gadgets on physical and brain development of their child.

III. GOAL OF THE STUDY

Children are living in world of interactive media and advanced technology. Children are growing up and developing their skills and capabilities with the presence of digital devices that have become part of our culture and environment at work, at school, at home and in every field of our community. Specifically, these tools have been a source of transforming the management of parents and families in their daily lives and use these tools for the purpose of having entertainment and providing their children a source of leisure. Teachers are using these tools in the school and classroom for the preparation of syllabus and educational material. This study aims to identify the influence of technological tools on the mental smartness of kids, whether they are being smart due to the use of the tools or they are mentally smart and using these tools according to their smartness.

IV. IMPORTANCE OF STUDY

The increasing time duration children spending on computers, laptops, palmtops and smartphones has promoted the concerns of parents and researchers how the use of these advanced tools is making difference in the mental development of the children. It is observed that the children are involved in taking help for their homework and educational tasks that make them smart due to increased knowledge of children. This article provided an overview of the effects of advanced technology on the mental development of children and identifying the influence of these tools on the smartness of kids.

Research Question

Following Research Questions are designed to have detailed knowledge about the topic:

- What are the effects of advanced tools on the mental development of children?
- What are the purposes for which children use advanced tools?
- What is the role of parents in developing children mental development?

Research Limitation

This research study is limited to identify the influence of advanced tools at children from the age group of 5 to 15. Additionally, the respondents will be caretakers, guardians, and parents of the children, as there will more chance that this group of respondents will be a source of identifying detailed information about the defined topics. It is possible that there will be a chance of biases from the respondents in providing authentic information that may limit authenticity of data gathering procedure.

Data Collecting Methodology

Introduction

This section of the report comprises of methodology for the execution of the study and specifically for data collection process. In this chapter of the study, the researcher had included all important research tools, techniques, the process for the process of data analysis and delivering appropriate results. Data that was gathered for conducting the study and survey procedure was gathered through primary and secondary sources with the approach of a mixed method that is conducting the survey, analyzing data through quantitative method, also conducting interviews with the respondents, and analyzing data through qualitative method.

Research strategy

In this section of research methodology, research study identifies the technique that will be used for the purpose of data collection. These techniques ranged from case studies, action research, surveys, experiments, ethnography and grounded theory (USC, 2016). This study used survey method that will identify the opinions of respondents.

Research design

Through structuring appropriate research design, researchers can cater identified research problem in themore systematic way (laerd dissertation, 2012). This research study emphasizes on
exploratory research design that involves survey and interview methods that are utilized to explore the research topic. This research used mixed approach through collecting data from primary sources and analyzing through quantitative and qualitative means.

**Sample Size and Design**

The sample of this research study involves 15 respondents that are selected for gathering data and two respondents are selected for the interview process that will help the researcher to identify detailed knowledge about the topic. All respondents were selected through executing convenience sampling method as this sampling method consume less time and can be a source of gathering relevant information from the respondents.

**Sources of data collection**

Researchers have two important sources for the purpose of data collection that are titled as primary & secondary data sources. Primary data is characterized as original data that is collected for the identified research topics. It is also called first-hand information (Kauerper, 2016). Secondary data is titled as findings of other prominent researchers that is used by another researcher in order to provide reliable and authentic information. Additional sources of secondary data include websites, published journal, articles, newspaper and books. Primary data was gathered through using questionnaire and interview that is conducted with the respondents.

**Questionnaire Result**

Respondents were given a questionnaire having 12 questions that were designed to identify relevant information about the topic of the research. The first question was about indicating their gender. Below mentioned table and graph indicate that there were 10 males and 5 females who participate in the survey.

<table>
<thead>
<tr>
<th>What is your gender?</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Male</td>
<td>10</td>
<td>66.7</td>
<td>66.7</td>
<td>66.7</td>
</tr>
<tr>
<td>Female</td>
<td>5</td>
<td>33.3</td>
<td>33.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Next question that was asked of the respondents was about identifying their family type, 9 of the respondents indicates that they live in joint family and 6 of the respondents indicates that they live in anuclear family.

<table>
<thead>
<tr>
<th>What is a family type?</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Joint</td>
<td>9</td>
<td>60.0</td>
<td>60.0</td>
<td>60.0</td>
</tr>
<tr>
<td>Nuclear</td>
<td>6</td>
<td>40.0</td>
<td>40.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Next questions for which respondents answer the question were about identifying the tasks which their child executes in their free time. The majority of the respondents indicate that their children like to watch movies and cartoons in their free time, four of the respondents that their children like to play games in their gadgets and advanced tools and devices. Only two of the respondents identify that their children like to play outdoor games, only one respondent indicates that their children like to read books and involve in physical activities.

<table>
<thead>
<tr>
<th>What do your children like to do in free time?</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid  Physical activities</td>
<td>1</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Reading Books</td>
<td>1</td>
<td>6.7</td>
<td>6.7</td>
<td>13.3</td>
</tr>
<tr>
<td>Movies and Cartoons</td>
<td>7</td>
<td>46.7</td>
<td>46.7</td>
<td>60.0</td>
</tr>
<tr>
<td>Gadgets and device games</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>86.7</td>
</tr>
<tr>
<td>Outdoor games</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Respondents also indicate about the purpose behind the use of gadgets and advanced tools, that are used by their children. A similar number of respondents indicate that their children use their advanced tools and gadgets for the purpose of doing their
homework, playing games and watching cartoons and movies. Three of the respondents indicate that their children use gadgets for learning new things.

**For what purpose your children use gadgets and advanced tools?**

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning new things</td>
<td>3</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>For homework</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>46.7</td>
</tr>
<tr>
<td>Playing games</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>73.3</td>
</tr>
<tr>
<td>Watching cartoons and movies</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Next question that was asked of the respondents was about indicating their views about the effect of advanced technology in enhancing the educational performance of their children. Three of the respondents indicate that they strongly agreed, four respondents identify that they agreed, two respondents give an opinion that they were neutral, four total respondents identify that they disagreed and two respondents strongly disagreed about this point of view.

**Technology is helping your children in improving their educational performance**

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>3</td>
<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>46.7</td>
</tr>
<tr>
<td>Neutral</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
<td>60.0</td>
</tr>
<tr>
<td>Disagree</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>86.7</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Next question that was asked of the respondents was about indicating their views about the effect of advanced technology in
enhancing the learning process of their children. Five respondents strongly agreed, 3 agreed, 2 of the respondents identify that they
were neutral, 2 respondents disagreed with this statement and 3 respondents indicate that they strongly disagreed with this point of view.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Agree</td>
<td>3</td>
<td>20.0</td>
<td>53.3</td>
</tr>
<tr>
<td>Neutral</td>
<td>2</td>
<td>13.3</td>
<td>66.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>13.3</td>
<td>80.0</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>3</td>
<td>20.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Next question that was asked of the respondents was about indicating their views about the effect of advanced technology in
creating more strong bonds with peers and other adults. 4 of the respondents strongly disagreed, 2 respondents strongly agreed, none of
the respondents agreed and neutral, 9 respondents disagreed and about this point of view.
Technology is helping your children in creating more strong bonds with peers and other adults

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Neutral</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Disagree</td>
<td>9</td>
<td>60.0</td>
<td>60.0</td>
<td>73.3</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Next question that was asked of the respondents was about indicating their views about the effect of advanced technology in identifying their hobbies and involving in physical activities. 1 respondent indicates that he or she strongly agreed with this statement, 2 respondents agreed, 5 respondents were neutral and disagree and 2 of the respondents were strongly disagree about this point of view.

Technology is helping your children in identifying their hobbies and involving in physical activities

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Strongly Agree</td>
<td>1</td>
<td>6.7</td>
<td>6.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
<td>20.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>5</td>
<td>33.3</td>
<td>33.3</td>
<td>53.3</td>
</tr>
<tr>
<td>Disagree</td>
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<td>33.3</td>
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</tr>
<tr>
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<td>13.3</td>
<td>13.3</td>
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</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Next question that was asked of the respondents was about indicating their views about the effect of advanced technology in enhancing IQ level of children. Only one respondent was strongly disagree, three disagreed, three indicates that they strongly agreed, three said they were neutral about this and five respondents agreed with this.

### Technology is a source of enhancing IQ level of children.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Strongly Agree</td>
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<td>20.0</td>
<td>20.0</td>
<td>20.0</td>
</tr>
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<td>Agree</td>
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<td>33.3</td>
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<td>20.0</td>
<td>20.0</td>
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</tr>
<tr>
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<td>6.7</td>
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<tr>
<td>Total</td>
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<td>100.0</td>
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</table>

Next question that was asked of the respondents was about indicating their views about More exposure to technology is a source of relying on tools instead of depending on the cognitive ability of children. Among all respondents three respondents indicate that they strongly disagreed, two respondents agreed and a similar case for respondents who strongly agreed. A same number of respondents were neutral and disagree.
More exposure to technology is a source of relying on tools instead of depending on the cognitive ability of children.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Agree</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Neutral</td>
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<tr>
<td>Disagree</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>3</td>
<td>20.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
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</table>

Next question that was asked of the respondents was about indicating their views about their belief about giving technology to children are a decent idea. None of the respondents strongly disagreed about this point of view, 4 of strongly agreed and same were neutral, 5 respondents agreed.

Do you believe technology in the hands of children as young as five is a practical and good idea

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>4</td>
<td>26.7</td>
<td>26.7</td>
</tr>
<tr>
<td>Agree</td>
<td>5</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Neutral</td>
<td>4</td>
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<td>26.7</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>13.3</td>
<td>13.3</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Next question that was asked of the respondents was about indicating their views about their belief about more technology should be put into the hands of children sooner. There were five respondents in total that identify that they strongly agreed with this statement, only two strongly disagreed, three respondents indicates that they agreed and two were neutral about this statement.

<table>
<thead>
<tr>
<th>Do you believe more technology should be put into the hands of children sooner</th>
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<tbody>
<tr>
<td>Frequency</td>
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<tr>
<td>Total</td>
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</table>

V. RESULT ANALYSIS

From above results and opinions, this study put forward that the technology has emerged since the rise of the last generation. Children nowadays are involved in using advanced technologies, gadgets, and tools to search for their educational materials that provide them a better understanding and in-depth knowledge of any topic. When the children learn to use these advanced tools and technologies they are able to gain more knowledge and understanding about anything they need. Today children are
growing smarter as compar to children of the era before the digital age.

Technology itself had made the children smarter as it provides children to look into the collective knowledge of mankind, and learn certain subjects with free and easy access. However, it is significant to consider that whether technologies are making children smarter or they are extremely depending on these tools to have an easy solution to their complex work and gain nothing except negatively influenced development. It is not important to gain some information, use it and attain good scores in school or any other activity. Children are using these technologies neglecting their physical, cognitive and emotional development. They cannot be able to face different situations and challenges, as using gadgets and technological equipment are working as a tool on which they are completely dependable. Results indicate that children are nowadays moving towards the age where parents will make their children bounded with these technologies and limiting their thinking capabilities to solve the complex matters and issues that will surely make children dumb instead of making smarter.

VI. CONCLUSION AND RECOMMENDATION

Modern technology cannot be stopped and its evolution cannot be limited, whether it is providing learning objectives or negatively influence development to the children. It is important for parents, teachers, professional, healthcare providers and students too to determine specific goals for children and use of technology that will support efforts of children to meet their goals in life. Children cannot be expected to get advantages from advanced technology, if their caretakers, guardians, parents are not familiar and interested in the modern technology and its potential disadvantages and advantages. They are required to monitor the children and guide them to make effective and efficient utilization of these technologies that can improve their mental capabilities and also involve some physical activities that can make the children smarter on the basis of technology.

REFERENCES


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www.ijsrp.org
Female students are more likely to get higher grades than male students

Dr. Mousa Khaleel

UAE_ABUDABI_ALAIN

Abstract- Education is an essential requirement and it must be fulfilled for every individual. The requirement has been declared as the basic human rights along with the food and shelter by the United Nation Organization as well. Apart from that, the education reflects the personality of a person, so as the grades as well. The grades mirror the person’s behavior and its attitude towards its academics irrespective of whatever educational background the person possesses. People say that girls are always smarter than boys. Therefore, in this research paper I’m going to prove that female students do tend to get higher grades than male students do. Female students tend to care more about studies and they work harder than male students do. Boys are more interested in technology than girls since they are always on the computers exploring and video gaming and they rely on technology more than girls do. There definitely are solutions that could make both genders on the same academic level such as including more technology in studying and including more practical work in academics.

Index Terms- education, grades, academics, Female, males

I. BACKGROUND

Education has been considered among the basic rights of human beings. Ever since the emerging of technology and globalization, the importance of education has also enhanced up to a wider extent. From the learning perspective, the sex has seemed to play a significant role. The role plays an essential role in motivation, attitudes, and achievement of students. There are several factors which are supposed to be important in the language learning process like cognitive, educational and social factors(Dayroglu & Asik, 2004). With the help of these factors, the researcher has aimed to identify the effect of the better command regarding the learning process in both of the sexes (i.e. in males and in females).

Several types of research have been done on the topic of the comparison between the performances of male student and female students. The female students are found good in grades than the male students(Unity, 2015). The female students are claimed to have better learning skills as compared to the boys. However, the male students are found to have intelligence and better understandings of technology than female students.

Motivation is supposed to be an important element in the better learning and for motivation, good grades matter a lot. In this regards, several differences have been found in between both the genders. The intellectual level, the learning skills, the analytical skills, along with multiple other skills play an important part in making the differences more widened. The males are reported with much better analytical skills but less performer in learning skills.

Achievement is defined in terms of good grades. The students having good grades in all of their subjects regardless of their stage of education (either they are in their school, high school, university or some any other place). The cognitive abilities of every individual measure the focus of an individual and display them in their test scores.

Earlier in times, the gender differences are considered to be followinga stereotypical pattern in the tests identifying the achievements. However, with gradual changes in times and the nature of the tests have changed also, but the females are found to be abetter performer than the male students. The respective gender differences have been lying in between female students and male students for many years.

Researchers and Educationalist have attempted several approaches for the explanation of this contradiction which has been apparently observed between both genders and the differences in the achievements. Multiple researches have been done on the topic and it has been reported that school grades put a significant impact on the learning skills of the student (either it is a male or a female). Grades also reflect the behavior of the students in social context within the classroom. The marks which a student gets in the classroom, although requiremany efforts but it influences the student for a longer period of time. On the other hand, the performances in some kind of standardized tests used to assess the specialized abilities and the critical capabilities of the student (irrespective of its gender) eliminating the influence of society. Other researchers have also elaborated some factors which used to create some distinguish between the school marks and the achievements which a student gets. The factors which the researchers have included in the study are the learning capability, along with the level of familiarization with the setting with the test, the confidence level, and the anxiety level also put significant impact on the performance of the student eliminating the gender factor(Yau & Cheng, 2012).

II. LITERATURE REVIEW

Education is supposed to be the basic human rights which must be fulfilled at every cost. It is the Government responsibility to make every child educated. Ever since the emergence of globalization and technology has also become developed, several governments have started taking active steps towards the action of giving education to each and every child. It is important because the world is moving very fast in terms of science and technology while awareness of getting an education has also become an important element.
The gender differences also play an important role in getting the education. Usually, in the low economic countries or the countries of the third world has paid less attention towards the education of female. Gradually, such steps have been taken against such unfairness that now the education for females has also become equal important (Khan, Nawaz, Chaudhry, Hyder, & Butt, 2012). A similar gender difference has now created a pattern which has now become contradicting to explain and that pattern is defined as the good grades are been taken by the female students more than the males.

The female students (regardless of the educational background) are found more active in the academics than the male students (Economist, 2015). It is a fact that male students are having much knowledge about the technical world and their intelligence level is entirely different from a female but still, the difference between the grades is similar and still at its position. The grades in academics (either the students belong from any of the educational institutes or lying at some other educational stage) has created a typical pattern that female students are going better in the race than male students (Coskun, 2014).

Several factors are used for the investigation of the respective study such as the confidence level of the students, the level of formality with the test, the utilization of technology, and others (Brown, 2015). The male students are claimed as having much better analytical skills than the female students and in the activities associated with the utilization or usage of some advanced technology, the male students are found better performer, leaving the female students behind in the scores. However, when the point of research comes to the activities associated with the academics purely then, in this regards the female students are found performing better than the male students. In academics, the female students are observed as getting better grades than the male students. The confidence level of the female students which was lacking at the use of technology is found dominant at the academic tests. On the other side, the male students are found more enjoyable towards the use and utilization of technology for the studies as compared to the female students (Gnaultati, 2014).

In 2007, a research is conducted between the Chinese students and the Western students regarding the gender difference from the perspective of technology utilization. The results have reported that both Chinese and British female students are having less confidence level than the Chinese and Western male students. Even though the learning skills of the female students are more but the computer handling and computer skills were lesser than an average male student (Li & Kirkup, 2012). It has been concluded that the computer world in male dominant while the academics is somehow female dominant.

The purpose of the Study

A gender difference has been playing an important role in measuring the achievement of students irrespective of their education level. It has been identified that there are some differences in the skills between the genders and those differences are putting significant impacts in the society and over the behavior of students within the premises of their educational institute as well. This study has been conducted in order to identify that is it true that female students are more likely getting good grades as compared to the male students when the external circumstances are supposed to be similar for both of them.

The importance of the Study

Grades play an important role in building the confidence level of any student. The grades mirror the attitudes and behaviors of the students within the premises to whatever the educational institute they belong and whatever the educational level, the students are experiencing. The grades contribute a lot in establishing the personality along with the designing of future of the student. The respective study is important because the grades define the student’s areas of interests and help the students to choose which circle or field of interest to pursue the career.

Research Question

The research questions for the research are:

Q1: Why the difference has created between the female student grades and male student grades?
Q2: What is the pattern of difference between the female student grades and the male student grades?
Q3: Is there any impact of technology?
Q4: What are the factors, which are playing an ineffective role in the discussion associated with the gender difference?

Research Limitation

For the purpose of having a detailed investigation, two surveys have been conducted with the sample of 15 people for each of the surveys. The survey was conducted in two different schools of males and females. The survey is limited to the students of age lying from 10 to 15.

Definition of Terms

- Gender Difference: The gender difference is referred towards the group of differences that are commonly found among the average males and females in a society.
- Academics: It refers to the person having an educational background.

Methodology

The following study has aimed to investigate the behavior of male students and female students as the female students are found getting higher grades than the male students while the external circumstances remain similar.

Research Philosophy

Positivism is basically defined as a claim to a purpose which is unbiased in nature and independent of anyone’s specific or person point of view. Therefore, if a researcher attempts to have any philosophy based on positivism then it clearly shows that that the researcher have a freedom of space in defining the perspective and the researcher’s perspective is not affecting the main purpose or the subject of the overall study. The adaptation of positivism further indicates that the researcher wants to work with natural sciences that are observable in real in the study. In other words, positivism led the study towards the quantitative data analysis. In the type of research that has positivism in nature...
usually have some relationships or correlations between single or multiple variables (Dudovskiy, 2016).

**Approach for Data Collection:**

The approach for the data collection is quantitative in nature. The quantitative data collection method is implemented because the data will be gathered from surveys which are supposed to be conducted in two different schools. A questionnaire will be given to the students and they have to fill the required spaced with the specific answers. The answers will help the researcher in gathering and extracting the information. Later, the results will be extracted from the gathered and extracted information.

**Questionnaire Results:**

1. How enjoyable is the academics?

<table>
<thead>
<tr>
<th></th>
<th>Extremely enjoyable</th>
<th>Very enjoyable</th>
<th>Enjoyable</th>
<th>Less Enjoyable</th>
<th>Not at all enjoyable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Females</td>
<td>6</td>
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<td>1</td>
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</tbody>
</table>

2. How enjoyable do you find the association of technology with the academics?

<table>
<thead>
<tr>
<th></th>
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<th>Enjoyable</th>
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<tr>
<td>Females</td>
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<td>2</td>
<td>4</td>
<td>5</td>
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</table>
3. As compared to your whole class at which point would you grade yourself in academics (in %)?

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<tr>
<th></th>
<th>1 -20%</th>
<th>20- 40%</th>
<th>40-60%</th>
<th>60- 80%</th>
<th>80- 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>3</td>
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<td>6</td>
<td>2</td>
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</tr>
<tr>
<td>Females</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>3</td>
</tr>
</tbody>
</table>

4. As compared to your whole class at which point would you grade yourself in technical information (in %)?

<table>
<thead>
<tr>
<th></th>
<th>1 -20%</th>
<th>20- 40%</th>
<th>40-60%</th>
<th>60- 80%</th>
<th>80- 100%</th>
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<td>Males</td>
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<td>6</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Females</td>
<td>4</td>
<td>5</td>
<td>3</td>
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<td>1</td>
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</tbody>
</table>
5. As compared to the FEMALE fellows in the class at which point would you grade yourself in academics (in %)?

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<tr>
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<th>1-20%</th>
<th>20-40%</th>
<th>40-60%</th>
<th>60-80%</th>
<th>80-100%</th>
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<td>Males</td>
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<td>3</td>
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</tr>
<tr>
<td>Females</td>
<td>0</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

6. As compared to the MALE fellows in the class at which point would you grade yourself in technical information (in %)?

<table>
<thead>
<tr>
<th></th>
<th>1-20%</th>
<th>20-40%</th>
<th>40-60%</th>
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<tr>
<td>Females</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>1</td>
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</table>
7. How useful do you think is your technical skills in the modern world?

<table>
<thead>
<tr>
<th></th>
<th>Extremely useful</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Less Useful</th>
<th>Not at all useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Females</td>
<td>3</td>
<td>4</td>
<td>3</td>
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<td>2</td>
</tr>
</tbody>
</table>

8. How useful do you find Maths in Academics?

<table>
<thead>
<tr>
<th></th>
<th>Extremely useful</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Less Useful</th>
<th>Not at all useful</th>
</tr>
</thead>
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<tr>
<td>Males</td>
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<td>2</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Females</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
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</tbody>
</table>
9. How useful do you think the grades are for your future?

<table>
<thead>
<tr>
<th></th>
<th>Extremely useful</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Less Useful</th>
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<tbody>
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<tr>
<td>Females</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
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</tbody>
</table>

10. How useful do you find the maths and the relative subjects are in the modern day world?

<table>
<thead>
<tr>
<th></th>
<th>Extremely useful</th>
<th>Very Useful</th>
<th>Useful</th>
<th>Less Useful</th>
<th>Not at all useful</th>
</tr>
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<tbody>
<tr>
<td>Males</td>
<td>2</td>
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<tr>
<td>Females</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
III. RESULT ANALYSIS

Two surveys have been conducted in two different schools (i.e. one female dominant school and one male dominant school). There were 30 respondents in total (15 males and 15 females). Question 1 was asked about the enjoyable factor in academics. The females were found enjoying their academics journey more than the males. Question 2 was asked about the association of technology with the academics, in this case, the females were found less associated with the technology, however, the males were found excited about the association of technology with the academics. In question 3, when the respondents were asked about the comparison of them with their other fellow in terms of academics. A large population of males has put them at an average position. While the similar question was asked with the females, most of them have put them at the above average position. The question 4 was asked about the comparison of them with their fellows. In this case, again the males have put them in a balanced position while the females have put them in a below average position. In question 5, the respondents were asked to compare them with the other female students from the perspective of the academic. There were multiple answers but there were an equal number of male respondents in the below average and average position. On the other hand, when the similar question was asked with the females, most of them have placed them at the average position while none of the females has placed itself to the least most position. The question 6 was similar with 5 but this time, the comparison was presented with the Male students and from the perspective of technical information. The results have reported that mostly males consider them at average while the females have also considered them below average and average positions. Question 7 was asked about the utilization of technical skills in the modern world. In this regards, mostly males have considered the utilization as useful while the females also think in the same way. Question 8 was asked about the usefulness of mathematics in the academics. In this regards, mostly males have considered maths as useful while some of them have considered it less useful. On the other hand, a significant population of females has considered maths as extremely useful in the academics, because maths contribute a larger factor in the good grades. The question 9 was about the utilization of grades in the future and in the establishment of acareer. A significant number of males have considered the grades as less useful in the establishment of career while some of them have considered as a waste as well. Contrary to that, the females have considered grades as the building element in pursuing the career. In question 10, the respondents were asked about the usefulness of subjects in the progress and development of themodern day. A significant number of males have considered it as less useful while the females have considered the theoretical studies as extremely useful.

IV. CONCLUSION AND RECOMMENDATIONS

Education has been considered as the basic human rights by the United Nation Organization. The awareness program has been initiated by governments for their citizens. Although in the third world country, there are still some lacking in the education and their relative educational program.

The above study has aimed to investigate the behavior of students regarding their academics and other on- academics skills. The respective research has aimed to investigate the features because of which the females are supposed to be getting higher grades in the academics than their male fellow students while the external circumstances are kept similar for both of them.

For the analysis purpose, there have been conducted two surveys in two different schools; one school was male dominant while the second school was supposed to be female dominant. A detailed questionnaire (having some questions related to academics, some to none- academics while the remaining questions were associated with the skills of the students) was given to the students and the students were asked to fill up the question with the required and desired answers. The answers have claimed that the girls are supposed to be more linked to the academics while having fewer interests towards none- academics and technical education. Opposite to that, the males were reported having a keen interest in the non-academics or in the
technical education while the makers have also considered their grades as the less useful element in their future and in establishing their career. Apart from that, the males have considered their academics as boring while they also think that the education or the academics could become interesting if the courses are made linked with the modern day technology.

It is concluded from the whole research or the above-conducted study that there should be some utilization of the modern day technology in the academics to make it more interesting and attractive for the students. Apart from that, the girls which are found taking higher grades in academics are found less attentive in the use of technology. The female students are found having a good confidence level in dealing a class test while the similar girls are found having less confidence level in utilizing the technical skills or the technology.

Referring towards the future recommendation, then in this regard and from the above-concluded results, the use of technology and its association with the academics has become a must requirement. This will enhance the interests of female students in the technical knowledge while on the other hand, it will generate the interests of male students in the academics as well.

REFERENCES


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Using Stories In Teaching English

Dr. Mousa Khaleel

UAE _ABUDABI_ALAIN

Abstract- English plays an important role in every part of the world. English is omnipresent in every sector and every walk of life. The young learners should be shown the importance and the interest of learning English for their better future. In schools teachers give much importance to vocabulary, grammar, pronunciation and try to cover their portions for the examination. Young learners are fond of listening to tales and stories and this researcher firmly believe that stories help young learners to learn the language successfully. This paper will focus on the importance of using stories by conducting various activities among young learners in the language learning process.

Index Terms- genuinely, appeals, demonstration, organic, memorable, hammering, reluctant, angle of engagement, incorporate, engage, adolescent, demonstration, fantasy, incorporate, a hypothetical, linguistically honest, challenging

I. INTRODUCTION

Stories guide us through our whole life from the moment we were born and it does not change when we become teenagers or adults. When we are children, our grandparents tell us or read us stories and tales, when we grow up we read stories ourselves and sometimes we play drama in schools or we hear stories in radio or watching a film on TV. Stories are for all of us, not just for children

I chose the topic using stories in teaching English because I believe that stories are important not only in our mother tongue. Children enjoy listening to stories, they are familiar with narrative conventions, and they can make elaboration and predictions about what will happen next. Stories are a suitable introduction to English language as they present language in a familiar and enjoyable context. Stories could help us in learning and it could be more fun because students never forget stories.

We concentrate our work on pupils at Al Hamdaniah secondary school, in Al Ain, that means children from 12 to 15. Each week they have 5 English lessons. Most of the teachers want to use stories as a supplementary teaching aid and to follow national curriculum to finish the semester on time. Thus There should be a plan to use stories perfectly within English class..

Aims

• To by the end of this lesson the students will be able to successfully form past simple object questions in writing.

Significance of Study:
The research will explain how the affect Using Stories In Teaching English

Statement of the Problem:
Using Stories within the school curriculum enhance teaching English

Research question:
How Using Stories enhance learning English?

Methodology:
This research is qualitative study. The reason for adopting qualitative study is to Knowledge How Goals affect Using Stories In Teaching English. For the purpose we makes questioner. The questioner has been answered by students in one of Al Ain school. The study will end with the recommendation for Student Motivate to using stories to teaching English in respectable way.

Review of Related to literature:
"Psychologists believe that children need stories, legends and fairy tales when they grow up. They are a part of children’s intellectual life. They provoke their fantasy and give them answers to important questions of a child’s life. They are meaningful and effective item of their socialization. Myths and legends give material of which children make their concept of origin and purpose of the world and of ideals, which they may follow." (Krashen, 1983)

"Stories are useful in language learning for young learners. Young learners acquire language unconsciously. The activities you do in class should help this kind of acquisition. Stories are the most valuable resource you have. They offer children a world of supported meaning that they can relate to. Later on you can use stories to help children practice listening, speaking, reading, and writing." (Slatterly & Willis, 2001).

"Story telling can be effective for teaching English to young learners for the following reasons.

• The purpose of telling a story is genuinely communicative.
• Storytelling is linguistically honest (It is oral language, meant to be heard).
• Storytelling is real (people do it all the time).
• Storytelling appeals to the affective domain.
• Storytelling caters to the individual while forging a community in the classroom.
• Storytelling provides listening experiences with reduced anxiety.” (Curtain & Dahlberg, 2004)

**Assessment:**

"Assessment in the Short Stories module will focus on learners' demonstration of their ability to:

a) understand concepts and techniques of short story writing.
b) apply this understanding to create short examples.
c) produce a written short story.
d) comment helpfully on the work of others.
e) tell or perform stories orally.
f) read and comment on a number of short stories." (Caldwell, J, 2002)

**Teaching Strategies to Include Stories:**

"Should we schedule time for it, or should it be organic? Should we attach requirements to storytelling, or simply allow it for fun? Honestly, there’s no right or wrong way to include them. Here are a few simple approaches you might take to include storytelling in your classroom:

• **Share your own stories, just for fun:** Tell them about when you were their age, about times you failed, succeeded, or about memorable lessons you learned. This builds a strong connection between you and your classroom, letting them know that you can relate to them, and vice versa.

• **Use stories as introductions:** Just as we encourage students to use attention-getting devices for their essays and speeches, we can use the same technique as educators. Begin class with an interesting story, but one that is relevant to the lecture’s focus.

• **Use stories as illustrations:** When you’re hammering through a relatively difficult concept with your class, one easy way to explain it is to illustrate the concept with a story. When facts and figures won’t do, simple narratives sometimes can.

• **Tie storytelling to learning goals:** We want our students to develop listening skills, and we can incorporate storytelling into the larger picture of achieving these outcomes.

• **Tell stories to engage reluctant learners:** Some students experience difficulty connecting to drab textbooks or abstract concepts. However, those same learners typically have little struggle connecting to stories. Through telling stories, you make life and learning more relevant, giving reluctant learners a better angle of engagement.

**-Types of Stories**

There are several different types of stories you could potentially tell in your classroom. Harbor knowledge of each type, so if you’re lacking in one kind, you can replace it with another.

• A true story from your own life.
• A true story from the life of someone you know, like a friend, family member, or neighbor.
• A true story from the news or a current event.
• A story that took place sometime in history.
• A fictional story, with made up characters or events.
• An “Imagine if …” story that sets up a hypothetical situation.

Of course, there are various genres and styles of storytelling, but the above list represents the essential variety that you might incorporate into the classroom.”

(P1, Catapano Jordan)

<table>
<thead>
<tr>
<th></th>
<th>disagree</th>
<th>Strongly disagree</th>
<th>agree</th>
<th>Strongly Agree</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading stories improve my English</td>
<td>%10</td>
<td>%5</td>
<td>%40</td>
<td>%30</td>
<td>%15</td>
</tr>
<tr>
<td>Stories help me guessing the meaning of new words through context</td>
<td>%15</td>
<td>%3</td>
<td>%30</td>
<td>%35</td>
<td>%15</td>
</tr>
<tr>
<td>I use some of the words mentioned in the story</td>
<td>%15</td>
<td>%10</td>
<td>%40</td>
<td>%30</td>
<td>%5</td>
</tr>
<tr>
<td>Stories enhance my style in writing skill</td>
<td>%5</td>
<td>%1</td>
<td>%54</td>
<td>%30</td>
<td>%10</td>
</tr>
<tr>
<td>Stories are not helpful in pronunciation you might incorporate into the classroom</td>
<td>%30</td>
<td>%40</td>
<td>%15</td>
<td>%10</td>
<td>%5</td>
</tr>
</tbody>
</table>

**Table 1: Stories for learning English:**

From question number one, most of students 40% agree that reading stories improve their English, while in question two 35% of student strongly agree that stories help them guessing the meaning without using dictionaries.

Question three shows that students use most of the words they encounter in stories and in question four more than half of them agree that stories enhance their writing skill.

That last question states that stories are helpful in pronunciation because 40% strongly agree but 30% disagree and that perhaps those who disagree do not read stories in classroom with their teachers.
Table 2: stories for thought:

<table>
<thead>
<tr>
<th>Item</th>
<th>disagree</th>
<th>Strongly disagree</th>
<th>agree</th>
<th>Strongly Agree</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Stories is a good source of ideas</td>
<td>%5</td>
<td>%1</td>
<td>%40</td>
<td>50%</td>
<td>%4</td>
</tr>
<tr>
<td>2- Stories enlarge my vocabulary</td>
<td>%3</td>
<td>-</td>
<td>%35</td>
<td>%40</td>
<td>%22</td>
</tr>
<tr>
<td>3- I use dictionary to know the meanings of the new words</td>
<td>%15</td>
<td>%30</td>
<td>%25</td>
<td>%25</td>
<td>%5</td>
</tr>
<tr>
<td>4- I use some of the ideas and words to enhance my writing skill</td>
<td>%5</td>
<td>%4</td>
<td>%40</td>
<td>%45</td>
<td>%10</td>
</tr>
<tr>
<td>5- Stories help to build my personality through its ideal ideas</td>
<td>%5</td>
<td>%50</td>
<td>%30</td>
<td>%15</td>
<td></td>
</tr>
</tbody>
</table>

Question one shows that about half of student strongly agree that stories are a good source of ideas while question two states that about 40% of students agree that stories are a good source to enlarge their vocabulary.

Question three shows that 30% of student do not use dictionary to know the meaning of new words while about 15% use dictionaries whereas in question four 45%of student agree that ideas in stories help them in their writing skill. Question five shows that 50% strongly agree that stories help to build their personalities.
Table 3: stories in the classroom:

<table>
<thead>
<tr>
<th>Item</th>
<th>disagree</th>
<th>Strongly disagree</th>
<th>agree</th>
<th>Strongly Agree</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stories are a good supplementary aid in learning English in the classroom</td>
<td>%10</td>
<td>%0</td>
<td>%70</td>
<td>%20</td>
<td></td>
</tr>
<tr>
<td>Teacher should use stories during the lesson</td>
<td>%25</td>
<td>%10</td>
<td>%40</td>
<td>%10</td>
<td>%15</td>
</tr>
<tr>
<td>Each semester students should finish more than three stories or a novel</td>
<td>%25</td>
<td>%10</td>
<td>%40</td>
<td>%10</td>
<td>%15</td>
</tr>
<tr>
<td>Stories are necessary in classroom</td>
<td>%10</td>
<td>%5</td>
<td>%50</td>
<td>%25</td>
<td>%5</td>
</tr>
</tbody>
</table>

Question one shows that 70% of students agree that stories are a good supplementary aid in learning English in classroom while about 40% agree that teachers should use stories during class.

Question three about 40% of students agree to finish three stories each semester while about 25% disagree. Question four shows that 50% of students agree that stories are necessary in class.
Question one shows that about 70% of teachers agree that stories help them in teaching English. Question two shows that 10% of teachers agree that they could not include stories in their lesson. Question four shows that about 40% of teachers disagree that students should read stories at home. The last question shows that more than 50% of teachers are able to teach stories during their lesson.
II. The Result & Conclusion

Stories are an ideal tool in learning language as they guide us through our whole life. So, not only learning our mother tongue, but also other foreign languages through stories can make our effort more interesting, amusing and memorable. Students have an amazing ability to absorb language when activities are familiar and enjoyable to them. Teaching foreign language on the base of storytelling is exactly the activity which is both familiar and it is fun.

Stories are for all of us, not just for children, that is why using them in teaching adolescents is as important as using them in teaching young children. Stories can attract students’ attention, because they provide challenging topics based on their everyday interests such as love and friendship. They also provide a huge space for fantasy and creativity.

Stories may link English with other subjects across the curriculum, which I demonstrate in my theses. They teach students to think. All skills, functions and structures may be taught by stories. Vocabulary, pronunciation and creativity may be developed.

In my theses I have tried to make a lesson plan based on an extract from a real book, and even thou I had no opportunity to try it with a class I believe that students will like it and they will be motivated to read a whole book.

III. Recommendations

1. Stories are a perfect supplementary aid in teaching English.
2. Stories should be a part of the national curriculum.
3. Students should read at least three stories each semester.
4. There should be cooperation between teachers and parents to encourage student to read stories.
5. Students who read more should be awarded.
6. There should be a competition in writing stories in each school because some students are talent in writing.

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Marketing Myopia: The business ailment & Bangladesh’s Telecommunication Business
(A study on CityCell from users’ perspective)

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Prodduth Chatterjee (MBA-Marketing, Khulna University, Bangladesh)

Abstract: Marketing myopia, a high-lightening marketing theory projects crucial facts diagnosed in business organizations. Theodore Levitt, the real theorist tried to narrate how some misconceptions or constricted vision can impede a company’s long run. Marketing myopia is more or less is evident at some stage of a growing industry. It implies the conditions and matters, which can make the company to decide some strategic procedures which eventually hamper the long run of it. In this research, it has been trying to explain the aspects of marketing myopia where the main highlight concentrated on the Telecom industry of Bangladesh. The research is conducted to make a correlation between the concept of marketing myopia and its impact on the business. It moreover tries to find the valid possibility of the theory in practical aspects. For the research purpose, CITYCELL (Pacific Bangladesh Telecom Ltd.) had been chosen as a part of research procedure. The primary data was collected from both the company and through conducted survey on mobile users. The secondary data was collected from websites, articles and journal. CityCell with its strong corporate strategies maintained the progression of the company upward but in some aspects the company may regards some possible shortcomings regarding strategic actions. The research is mainly focused on the fact that how the conditions of marketing myopia affect the business strategy and how the company tried to escape the consequences of the error. Here the company’s own views and consumer’s perceptions are considered to accomplish the research The research made a possible correlation between the very theory of marketing myopia with the business outlook of CityCell and some recommendations are made to overcome such shortcomings. Finally, it can be expected, the research’s view and recommendation may be found cooperative for the theory as well as the business associates.

Key Words: Myopia, mobile, telecommunication, CDMA, GSM, population myth, users, marketing etc

1. INTRODUCTION

Business world is made of the balanced combination of various strategic advancement where the different segments like management, finance, marketing, promotional activity come together. Unhinged tendency in any of these segments can cause business strategic blunder and makes the business sufferer for long run. Marketing myopia implies a specific situation when the company unconsciously undergoes one kind of short-range and narrow strategic approach where the company futile to focus on the long-term business strategy, make mistake to understand the actual needs and wants of its consumers. Marketing myopia in the strategy of any company can results in the tumble to adjust or cope with the rapid movement of the market.

Meanwhile, as an example of generation-wise business procedure, communication times and again plays vital approach to the growth of human civilization to craft the later one beyond present. With the greater demands, better approach of communication emerges
where telecom proves as the answer of it. Telecom, short abbreviation of Telecommunication business defines a process of distant communication using technological means, principally via electrical signal or electromagnetic waves. Through the emergence of wireless telecommunication, the communication comes upon as the best growing industry in the modern business world. Various business channels come forward to participate in the business long run and gain profit. Though positioned as Third world country, Bangladesh proves itself updated in the growth of telecom business. The stories begun with the issuance of a license to a private operator as a term of provision of inter area cellular mobile service. It was a breakthrough of the long runner, monopoly telecommunication provider of Bangladesh Telegraph and Telephone Board (BTTB). Gradually several structural changes are taken to make improve in this sector of business where the domestic as well as foreign investors became encouraged to take participate. By the passing of time, it becomes one of the biggest sectors of Bangladesh.

In the growing industry of telecom segment of Bangladesh, Pacific Bangladesh Telecom Limited or better known as CityCell emerges as forerunner and later joined by five other mobile operators like Grameen Phone, Aktel (Now Robi), Banglalink, Warid (Now Airtel) and Teletalk. However, by the continuation of time, CityCell gradually shows sliding to cope with the mice race of the rapid growth of the telecom industry.

2. Objective:

The purpose of the study is to pursue a comprehensive review and to acquire comparative idea of the influence of Marketing Myopia in the business strategy of Bangladeshi Telecom companies especially of Pacific Bangladesh Telecom Limited (CityCell). As the conditions of marketing myopia is based on the following matters:

1. To identify the influence of the belief that “growth is assured by an expanding and more affluent population” and CityCell’s strategy
2. To identify the relativity between the belief that “there is no competitive substitute for the industry's major product.” And CityCell’s market status.
3. To find out the fact about “Too much faith in mass production and in the advantages of rapidly declining unit costs as output rises” with CityCell’s strategy.
4. To make a connection with the believe that “Preoccupation with a product that lends itself to carefully controlled scientific experimentation, improvement, and manufacturing cost reduction” with CityCell’s research strategy

Research Questions

To achieve the research objective researcher has to gather the answer of following questions:

H₁ = CityCell is not preferable to existing and potential consumer population of Bangladesh’s telecom
H₂= CityCell performs better than other mobile operator
H₃ = Mass production is less effective to decline the unit cost
H₄ = CityCell’s market study is moderately effective
The paper will provide an inclusive idea about marketing myopia and its likely influence on Bangladeshi telecom business especially on Pacific Bangladesh telecom Limited (PBTL). The characteristics and impact of marketing myopia will be critically analyzed on the ground of PBTL and some suggestions regarding this analysis of the report.

This report was conducted only on the Pacific Bangladesh telecom Limited, Dhaka Branch rather than all the telecom companies of Bangladesh. The second limitation was inability to access entire secondary data from PBTL due to strict managerial policy with no exception to grant.

3. LITERATURE REVIEW

Marketing myopia is a term used in marketing as well as the title of an important marketing paper written by Theodore Levitt. This paper was first published in 1960 in the Harvard Business Review, a journal of which he was an editor. Marketing Myopia suggests that businesses will do better in the end if they concentrate on meeting customers’ needs rather than on selling products. (Wikipedia 2014) Marketing Myopia” is the quintessential big hit HBR piece. In it, Theodore Levitt, who was then a lecturer in business administration at the Harvard Business School, introduced the famous question, “What business are you really in?” and with it the claim that, had railroad executives seen themselves as being in the transportation business rather than the railroad business, they would have continued to grow. The article is as much about strategy as it is about marketing, but it also introduced the most influential marketing idea of the past half-century: that business will do better in the end if they concentrate on meeting customers’ needs rather than on selling products. (Harvard Business Review, 2004)

“Marketing Myopia”, compels the readers to understand the importance of effectively set visions which are a catalyst for the company’s success. Most of the industries focus largely on their refined product and become victims of downfall in the long-run. They do not realize the cause of their diminishing growth because to them their strategies in product development and product enhancement are top-notch. They tend to blame external factors which might have contributed to their downfall but they fail to see the bigger picture underneath: their goals and visions did not focus on consumer preferences and needs.

some organizations mistakenly concentrate only on customer ‘wants’ Needs are something necessary for the maintenance of life at a basic or more evolved level see Maslow’s hierarchy of needs for survival, security, socialization, success and self-actualization. Wants are choices of how that need is to be fulfilled. Marketing myopia is mistaking wants for needs. Levitt gives example of drill bits which are wanted only until a better way of fulfilling the need for making holes Although needs are relatively constant, wants are influenced by the environment and individual background. Developments in the technological, socio-cultural, economic and political environment change what is ‘wanted’ to fulfill a particular need’. As these changes happen all the time, today’s growth industry is tomorrow’s industry in decline. (Kotler, Armstrong, Agnihotri &Haque, 2010)

Finally, Myopia is a term used and means to be shortsighted. In business, this would mean not having the foresight or long term plan to fully understand what business you are in as well as how to stay in it. (Rcain, 2011). Marketers must fulfill consumer needs and interests beyond what is good for the environment. (Ottman,Stafford & Cathy, 2006)

Levitt (1960) emphasized that the organizations which are working on the belief that their products are unique are ‘growth opportunities’ for them and would continue to give them success, do not realize that their dependence on such belief could be their downfall. He explains, “If consumers are multiplying and also buying more of your product or service, you can face the future with considerably more comfort than if the market were shrinking. An expanding market keeps the manufacturer from having to think very hard or imaginative.
Many sellers make the mistake of paying more attention to the specific products they offer than to the benefits and experience produced by these products….They are so taken with their products that they focus only on existing wants and lose sight of underlying customer needs. They forget that a product is only a tool to solve a consumer problem. (Kotler, Armstrong, Agnihotri and Haque, 10)

However three principles from the concept of marketing myopia:

1. Customers loyal to capabilities of products to fulfill needs not to products themselves. As the buy benefits not features of a product, marketing campaigns should emphasize key benefits over competitors.
2. Products have limited lifespan before demand shifts to preferred means to the same benefit. Concept of product life cycle of introduction, growth, maturity and decline stages
3. Organizations restricting themselves to one product or industry therefore limiting own life expectancy as will not be growth product or industry for ever (Stoke and Lomax, 2006)

The history of every dead and dying "growth" industry shows a self-deceiving cycle of bountiful expansion and undetected decay. There are four conditions, which usually guarantee this cycle:

1. The belief that growth is assured by an expanding and more affluent population.
2. The belief that there is no competitive substitute for the industry's major product.
3. Too much faith in mass production and in the advantages of rapidly declining unit costs as output rises.
4. Preoccupation with a product that lends itself to carefully controlled scientific experimentation, improvement, and manufacturing cost reduction. (Levitt, 1960)

Even in case of modern business world, two other conditions are found as believe in “Urban Myopia”. For example:

Rural markets are homogenous
Rural is about agriculture (Paninchukunnath’2011)

These strong points of the very concept got more clarified by Levitt through examples. Like: 

**Population myth:**
Firstly, if consumers are multiplying and also buying more of your product or service, you can face the future with considerably more comfort than if the market is shrinking. An expanding market keeps the manufacturer from having to think very hard or imaginatively. If thinking is an intellectual response to a problem, then the absence of a problem leads to the absence of thinking. If your product has an automatically expanding market, then you will not give much thought to how to expand it. (Levitt, 1960)

When the market for the product is growing the management tends to stop thinking about the future assuming that the growing market is the indication of future success. The management then focuses on expanding its production rather than thinking about marketing. The main focus of their concerns becomes selling which stems from the needs of the seller instead off the needs of the consumer. As Levitt narrates, if one assumes that sales are tied to the country’s population strings, because the customer can compare products only on a feature by feature basis. (Levitt, 1960). Companies that are not consumer oriented face marketing myopia. (Simmons, 2011)

**No Competitive Substitution Myth:**
The second argument by Theodore Levitt, the belief that there is no competitive substitution for the industry’s major product, could easily bring about the downfall for the organization. Executives also often fail to appreciate the competitive changes going on around them. They observe the changes, all right, but devalue their significance or underestimate their ability to nibble away at the company's
markets. (Levitt, 1960) When company gives insufficient attention to stakeholders they do so at great peril, their customer, their company, their society at large likely will be adversely affected. (Smith, 2009)

Narrating about Motorola’s myopic condition Jose Santos, Peter j. Williamson and Yves Doz said, “The myopic approach to competition and the failure to engage fully with rest of the world and capture the global markets and the innovative ideas in them, would cost Motorola dearly. (2004)

They also said, “Myopic competition, innovation using local knowledge, perfecting your product or service to meet the needs of consumers in your home market and benchmarking yourself against domestic competitors- each of these has become a high risk strategy. (Santos and Williamson, Doz’ 2004)

Ignoring or underestimating the threat posed by potential competitors and focusing only on current competitors is often referred to as “Competitor Myopia”. This term was coined by Theodore Levitt to describe situations in which firms fail to recognize the full scope of their businesses. Competitor Myopia can drive firms out of business! (Healy and Gomez, 2013)

**Faith in Mass Production:**
The third argument by Theodore Levitt, the belief that there is no competitive substitution for the industry’s major product, could easily bring about the downfall for the organization (Levitt, 1960). All effort focuses on production. The result is that marketing gets neglected (Levitt, 1960).

The lesson is clear; it is increasingly dangerous to rely on technologies and market understanding drawn only from your home territory (Santos, Williamson, and Doz, 2004).

The difference between marketing and selling is more than semantic. Selling focuses on the needs of the seller, marketing on the needs of the buyer. (Levitt, 1960)

**Preoccupation with Scientific Research and Development Techniques:**
Fourthly, The areas of the greatest unsatisfied needs are ignored, or at best get stepchild attention. (Levitt, 1960) It is true that most technological firms tend to focus their efforts towards scientific implementations and research and development which raises their cost and increases their chances of failure if the innovations are not receptive to the consumers.

The greatest danger which faces the glamorous new companies in this field is not that they do not pay enough attention to research and development, but that they pay too much attention to it (Levitt, 1960).

Levitt also narrated, thus, they are growing up under conditions that come dangerously close to creating the illusion that a superior product will sell itself. Having created a successful company by making a superior product, it is not surprising that management continues to be oriented toward the product rather than the people who consume it. It develops the philosophy that continued growth is a matter of continued product innovation and improvement.

In recent era, marketing myopia faces some new problems to include which is known as “New marketing myopia”. The nature of this business error is as below:

Marketers suffering from the new marketing myopia view the customer only view as “consumer”- a commercial entity to satisfy short-term material need via consumption behavior (Smith, 2009)

It stems from three related phenomena: 1) Single minded focus on customer to the exclusion of other stakeholders. 2) an overly narrow definition of customer and his/her need, 3) A failure to recognize the changed social context of business that necessitate multiple stakeholders (Smith, 2009)

[www.ijsrp.org](http://www.ijsrp.org)
Ways to avoid marketing myopia:
According to N. Craig Smith, Minette E. Drumwright and Mary C. Gentile, (2010), they offer five propositions for practice that will help marketers correct the myopia:

1. Map the company's stakeholders,
2. Determine stakeholder salience,
3. Research stakeholder issues and expectations and measure impact,
4. Engage with stakeholders, and
5. Embed a stakeholder orientation. The authors conclude by noting the implications for research.

According to Jose Santos, Peter J. Williamson, and Yves Doz (2004), Engaging with the world is not only sound defense; it can also act as a powerful new source of innovation

The other opportunities they offered such as

- Partnerships with lead customers: Using its knowledge prospecting skills, it located knowledge it needed in various customer sites in the United States and the Far East.
- Distributors: This allowed them to access knowledge that paved the way for later investments in building their own brands and distribution channels.
- Suppliers can provide access to new knowledge.
- Collaboration with universities and public research Centre’s can provide access to local scientific communities.
- Targeted acquisitions: When the pharmaceutical giant Glaxo Smith Kline bought Affymax, a pioneer in solid-state combinatorial chemistry, it got more than a technology for speeding up its development pipeline.

4. METHODOLOGY

Research methodology is a systematic means to solve a problem or give an answer to a question. It is essential for the researcher to design a methodology for the problem chosen. It is science of studying how research is to be carried out. Mainly research methodology describes how data are collected, what tools are used for this purpose and from whom the data are collected. Thus this section contains research design, data collection, sample selection and procedure for data analysis (Neuman, 2006)

The designed used for this research is an approach of quantitative method. The design is based on following the techniques of quantitative method. A structured question survey method is applied in this study. Quantitative research refers to the systematic empirical investigation of social phenomena via statistical, mathematical or numerical data or computational techniques (Given, 2008). In layman's terms, this means that the quantitative researcher asks a specific, narrow question and collects a sample of numerical data from participants to answer the question. The researcher analyzes the data with the help of statistics.

Quantitative research is often contrasted with qualitative research, which is the examination, analysis and interpretation of observations for the purpose of discovering underlying meanings and patterns of relationships, including classifications of types of phenomena and entities, in a manner that does not involve mathematical models. (Wikipedia, 2014)

Among different alternative categories of research, survey method with structured questionnaire was applied in this study. This is the questionnaire prepared in the first stage. Then from many available methods for survey, structured questionnaire Survey method had
been chosen to be exercised. The quantitative research helped to interpret the observation found in survey as well as the relationship patterns and hypothesizes.

This research is conducted based on two divisions (Dhaka and Khulna) of Bangladesh. Information of the study was collected from random mobile users of two cities.

The population of the research is the entire people of Bangladesh, to be more narrowly the people of Dhaka and Khulna who are the user of mobile service. The researcher has chosen random mobile phone users for the research. People from diverse age groups, occupation, gender, religion etc. that implies having diverse demographies and psychographic characteristics uses mobile communication for various communicative purpose. To conduct the survey among population consists of mobile phone users, a sample of 110 users had been taken out.

The research conducted on the sample of 110 respondents from the cities of Dhaka and Khulna. There are about 55 people are surveyed at Khulna and the rest was surveyed in Dhaka. As this study chose to apply factor analysis, and 44 questions (14 for obtaining basic information about the mobile users and 30 questions for surveying their opinions) of the questionnaire had been subjected to this analysis Taking acknowledge of the possibility of facing strict corporate secrecy the questionnaire will not apply to the mobile operator company but to mobile phone users only.

Measurement is often regarded as being only a means by which observations are expressed numerically in order to investigate causal relations or associations. (Moballeghi & Moghaddam 2008). In order to make an effective quantitative research, the sample of 110 respondents is being chosen. The sample was made on the basis of using various telecommunication operators’ connection. The sample mainly collected from Dhaka and Khulna. The respondent chose as random where discrimination in term of age, gender, race or ethnicity is completely avoided.

The study was conducted through survey methodology with a structured, close-ended questionnaire. Six questions had Yes/No response and another one was involved choosing from options indicating the preference of mobile phone usage by the respondents. Besides, all other questions were methodically measured on Likert scale. It is a balanced scale where number of categories will be five that means the scale will have odd number of categories. Those were ranged from 1 (= strongly disagreed) to 5 (= strongly agreed). The middle scale point considered to represent a neutral point containing a value = 3. Therefore, the scale did not actually allow the respondents not to have an opinion. Caution was taken to avoid ambiguous, complex, hypothetical, leading and loaded, double barrelled and burdensome questions without making assumptions and hidden contingencies. Fontana and Frey (1994), explains “Asking questions and getting answer is a much harder task than it may seem at first The interview etiquette consists of questions regarding the conditions of marketing myopia and how it is connected with Bangladesh’s telecom industry especially with CityCell.

Questionnaire:

The survey questionnaire that had been used in this study was split into two parts. The first part will ask for some general questions seeking information regarding respondent’s name, gender, age, semester, e-mail address and mobile number. Then second part used to screen out the impact of mobile operators’ business strategy and consumers’ view about need and satisfaction in terms of the variables of marketing myopia. Those questions were placed under appropriate variables or factors that helped to identify after the factor analysis.
Data collection is a significant part of the study. The sources of data can be classified into two types. They are Primary Data, and Secondary Data. Random mobile phone users of Dhaka and Khulna through survey methods collected required data from 110 sample respondents with the structured questionnaire.

Secondary data was collected from the executed and planned activities of the organization. Secondary information was also collected by reviewing previous studies conducted. In this study the secondary data sources included thesis, journal, research papers and various web sites.

At first to organize the questions under respective factors so that they can be used for further analysis easily, factor analysis had been applied. Along with the factor analysis, SPSS was chosen to apply in order to test the sampling adequacy.Then to achieve the first objective, to find the factors that affect the environment and health, one sample location t-test had been applied. In this study 5% level of significance was chosen.

5. Data analysis and key findings:

To make an actual research one must have to make a survey and proper analytical evaluation of it. The survey may be of various types like asking questionnaire, making direct or indirect interview and so on. As per my research is based on telecom industry so I have decided to make a survey upon mobile users of random operators. The telecom industry of Bangladesh is made of six main stand-like telecom companies like Grameen Phone, Banglalink, Robi, Warid, Teltalk and CityCell etc. the whole population according to their needs and preferences choose various operators to be part in digital as well as technological communication.

My survey is a question-based survey where under the beauty of wordy beauty the in formations regarding the nature of marketing myopia was surveyed. The survey mainly consists of total 30 questions focusing on four different factors of Marketing Myopia which consists of Degree of Mass Adaptation, Degree of Competition, Degree of Mass Production and Research & Development.

The survey was conducted upon random 110 of various people to make a versatile survey. The question was made of three parts where the query regarding myopia was asked only after it gets the answer givers basic general information regarding him or her whereas the degree of adoption comes following it. The question was unbiased from gender and age, The whole analysis was conducted using SPSS. The focused questions are hypotheses following Likert scale where each questions are conducted through analysis the data through finding the mean, standard deviation, sum and percentage. The total 110 respondents were participated where the number of male was 60 (54.5%) and the presence of Female respondents is 50 (45.5%). The age range was divided into four stages, which comprehend several stages of life such as 16-25, 26-35, 36-45, and 46- above.

Table: 01

<table>
<thead>
<tr>
<th>Gender (%)</th>
<th>Age (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
</tr>
<tr>
<td>Male</td>
<td>54.5</td>
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</tbody>
</table>

Research question 01: Degree of Mass Adaptation

To identify the influence of the belief that “growth is assured by an expanding and more affluent population” and CityCell’s strategy.
H₀ = CityCell is preferable to existing and potential consumer population of Bangladesh’s telecom
H₁ = CityCell is not preferable to existing and potential consumer population of Bangladesh’s telecom

The first part evaluates Degree of Mass adaptation inquires about the first weak point that can affect Marketing Myopia - the believe regarding illusion of company’s growth regarding affluent population. The company through running its operation in growth market, tend to believe that the consumers are loyal to them and the loyalty will influence a large quantity of population forever, there by the company’s progress will remain unparallel.

As the beginner in Telecom industry the company got initial popularity in the mass and in its growth stage, the progression was lukewarm. Now the reaction of the mobile users, who once was excited about the appearance of CityCell, has been changed. The questionnaire segment of this part is based on total eight (8) questions. Asking the questions like: CityCell is a popular mobile operator, CityCell is user friendly, I and my family use CityCell, I prefer CDMA rather than GSM, I believe CityCell offers better package, I would like to buy CityCell package, I would like to encourage others to purchase CityCell Package, CityCell prefers customer need than consumer’s need.

The tables 02 shows the correlation between the influence of the belief that “growth is assured by an expanding and more affluent population” and CityCell’s strategy. Here in one sample statistics the N indicates the number of respondants which is 110 and the Mean of all the questions are 2.6341 with standard deviation of .89943 with the std. Error Mean of 0.08576.

Here, the t test of all eight questions results the Mean of 2.6341, which is below the Test Value as well as the two-tailed significance, implies as 0.000, which also is below than 0.05. All these results indicate, Alternative hypothesis is accepted whereas Null Hypothesis is rejected. This result indicates that the relation between the population myth and the CityCell is matched as the mean is below the test or neutral value of 3 and the Level of Significance is 0.00 which is below 0.05. Though they attempt but still CityCell is not preferable to the mobile phone users comparing other operators. That means indicate that they hold at the growth stage on the consumers turn out as a disaster.

<table>
<thead>
<tr>
<th>Research question</th>
<th>N</th>
<th>Mean</th>
<th>Std Deviation</th>
<th>Std Error mean</th>
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<tbody>
<tr>
<td>Adaptation</td>
<td>110</td>
<td>2.6341</td>
<td>.89943</td>
<td>.08576</td>
</tr>
<tr>
<td>Competition</td>
<td>110</td>
<td>3.4831</td>
<td>.77573</td>
<td>.07396</td>
</tr>
<tr>
<td>Mass</td>
<td>110</td>
<td>2.7879</td>
<td>.94575</td>
<td>.09017</td>
</tr>
<tr>
<td>Research</td>
<td>110</td>
<td>2.6697</td>
<td>.95195</td>
<td>.09076</td>
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</tbody>
</table>

One Sample Test

Test Value = 3

<table>
<thead>
<tr>
<th>Research</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
</table>

www.ijsrp.org
Research question 02: Degree of Competition

To identify the relativity between the belief that “there is no competitive substitute for the industry's major product.” And CityCell’s market status.

H₀ = CityCell performs less competitive than other mobile operators  
H₁ = CityCell performs better than other mobile operator

Here the research question is asked as “How does CityCell exist in competitive market and how it performance level recognized as competitive?”

At the growth stage, the company enjoyed pure monopolistic business for some years. (Wikipedia, 2014) The year of monopoly leads them to consider having a market with no or less competitors. It is the second error of the company made during the error of marketing myopia.

This factor asked total seven (7) questions regarding consumer’s perspective whether or not the telecom industry has a competition as well as does CityCell is enjoyed better advantage than other operators.

The questions are: CityCell is most popular operator in Bangladesh. Other operators perform better than CityCell, CityCell is the least preferable mobile operator in Bangladesh, I like other operator for the GSM technology than CityCell’s CDMA, Other operators have good performance than CityCell, Other operators are better in promotional activity than CityCell, I would like to purchase other operator’s expensive package than CityCell’s cheaper package.

According to the formula, the mean must be upper than the Test Value, here the survey, the mean value which is 3.4831 (table 02) is higher than 3 which means the Null Hypothesis is accepted. It indicates the random mobile users think CityCell performs less competitive than other mobile operators. It implies two things.

Firstly, CityCell is in no monopoly zone and it faces competitors  
Secondly, CityCell performs below the competitive acts than other operators.

Research question 03: Degree of Mass Production

To find out the fact about “Too much faith in mass production and in the advantages of rapidly declining unit costs as output rises” with CityCell’s strategy.

H₀ = Mass production is effective to decline the unit cost
H₁ = Mass production is less effective to decline the unit cost

The research question is “How does the mass production and unit cost relation affect CityCell’s long run?”

Mass production is settled based on consumer’s demand, the more the demand, the more production and the less expense as costs get settled upon mass products. Here three questions are asked regarding this matter. The production segment is less interested to the consumers rather than marketing or promotional activities.

From the table 02, the summarized mean (2.7879) as well as Significance (2 tailed) 0.02 all implies that the null hypothesis is rejected and alternative hypothesis is accepted. Though the answers are taken from random consumers rather than any operator associated people so it can be say that as people consider that mass production is not always effective to manage unit cost. By this we can say that CityCell’s strategy is appreciable to prevent the error regarding marketing Myopia as they promptly handle the production procedure with the change of consumer demand and therefore the mass products are become moderate and financially the company was able to control, reduce and eventually eliminate the myopia error which most companies highly does.

**Research Question -04: Research and Development:**

To make a connection with the believe that “Preoccupation with a product that lends itself to carefully controlled scientific experimentation, improvement, and manufacturing cost reduction” with CityCell’s research strategy

H₀ = CityCell’s market study is not highly effective

H₁ = CityCell’s market study is moderately effective

The research question is “How does effective research study influence the business strategy of CityCell?”

The last set of questions is asked regarding the attribution of research and development segments and its utility in the strategic approaches of any company’s business. The research mostly based on survey or interviews where the company get close to its existing as well as potential consumers to get a better idea, better view regarding the consumer’s demand. A myopia-affected company hardly does [proper research. Its illusion makes obstacle to make elaborate survey. The survey then comes as the product or company’s any popular product based which make the research mostly failed. There are six questions are asked regarding the idea of research and development such as CityCell make survey on consumer’s need, CityCell has better research team than other operators, CityCell implements the outcome of public feedback, CityCell matches with customer’s need, CityCell updates technology according to customer’s demand, CityCell has bright future in Bangladesh’s telecom industry.

From the table 02, the projected mean of 2.6697 and significance of 0.00 all indicates the rejection of Null hypothesis. It implies that consumers think the company’s market study about consumer’s need and expectation is moderately effective. Offering low-priced offer and mainly positive decision about wise decision to convert into GSM technology mainly works in favor of CityCell.

**Finding regarding Research question 01:**

Among the four conditions Theodore Levitt explained, the first one is the believe about the co relation between growth and population. The condition was like “The belief that growth is assured by an expanding and more affluent population.” It is a popular myth about the consumers regarding the market growth. The companies has assumes a co relation between consumer status and future. Future is a very hard matter to visualize. The business organizations have the myth that the consumers can make the future more assured.
Here from the survey, CityCell is less preferable mobile operator in Bangladesh. According to the preference of mobile business and use of technology, it can be say that public demand is more motivated to the majority of mobile operators with the technology of GSM. If we focus on the report published by BTRC (2014) we can find that CityCell only possess 1.41% of total market share. Besides, from the survey on 110 random mobile users’ shows that they moderately like the technology of CDMA (51.8%) though aware about CityCell yet 19.1% people agreed and 4.5% respondents strongly agreed on the fact that CityCell is preferable. Though at the beginning CityCell was strong market share holder in Bangladesh’s Telecom industry but they failed to hold their users. It means CityCell slowly losses the preference as mobile operator in this country.

CityCell is considerate as user friendly at moderate level while the respondents are moderately willing to use CityCell as way of communication. The researcher query about the fact that whether the regular mobile users like the offers and packages of CityCell or they think the company offers user friendly services. The survey indicates the data that 28.2% people disagreed about the fact with a strong disagreed feedback found among the respondents about 10.9% . Besides 34.5% respondents shows their neutral view regarding the fact. The whole survey data points toward on thing and it is CityCell’s user friendly acceptance is moderately accepted and majorly rejected to the mobile users.

In our country, GSM technology is more preferable than CDMA. The preference is based on availability and flexibility of the technology around the area. As the BTRC reports shows that all the GSM technology based mobile operators have better position than CDMA based CityCell. Almost 99% of total market share is captured by GSM mobile operators. The survey shows 35.5% agreed and another 11.8% respondents strongly agreed about the fact that they prefer other operators over CityCell. Whereas 21.8% respondents agreed and 40.9% strongly agreed about the fact that they prefer GSM technology rather than CDMA. The reason behind the matter is the flexibility, network coverage and availability of accessories mainly highlighted.

CityCell according to public demand is less preferable as it gradually loose the market share of customers to GSM technology. The population myth affects the long run of CityCell

**Finding Regarding Research question02:**

The next finding is concentrating in the correlation between the second condition of marketing myopia and the business strategy of CityCell as the representative of the overall telecom industry. The second believe is about believing that there is no competitive substitute for the industry’s main product. If we think about the main product in telecom industry is the offering, then first the thing comes in mind is the technology offered by operators. According to the survey, the findings are as below:

The survey was conducted to know the fact that whether CityCell exists in competitive market and whether it attempts to handle the competition or not. The research found out the fact that CityCell is in competitive market. As it has to face huge competition from other five operators like (Grameen Phone, Robi, Airtel, Teletalk and Banglalink etc)

Secondly, it is also found out that CityCell is the soul provider of CDMA technology. According to Wikipedia (2014), CityCell is the sole operator, which uses CDMA technology. From this point of view, we can say that CityCell does not have any competitor in Bangladesh. The company enjoys the business of CDMA network in a monopolistic way.
Nevertheless, if the research focuses on the large picture of the telecom industry we will find that CityCell is in competitive field where it has to face strong competition from other operators, which provides the GSM technology. (BTRC, 2014) According to the research survey we also found out the same fact almost. As the survey implies around 21% respondent disagreed and 19.8% respondents strongly disagreed that CityCell is more popular than other operators. It also indicates with 20.2% agreed and 8.2% strongly agreed that other operators perform better than CityCell. It also command alarmingly that CityCell does not take much attempt to work on the competition with other operators as 25.2% respondent disagreed that CityCell offers better packages than others.

Consumers prefer other operators’ product because of GSM technology’s flexibility. As the survey indicates 40.9% agreed on the statement they like GSM technology rather than CDMA Technology. The whole findings regarding the second condition shows that the company has the influence of marketing myopia’s second condition and the company has faced strong competition to survive where it shows less action for the stronger sustainability.

**Finding Regarding Research question03:**

The third condition marketing myopia talks about the correlation between mass production and unit cost. As it implies that “Too much faith is mass production and in the advantages of rapidly declining costs as output rises”, Levitt called the condition as “Production Pressures”. Here Levitt describes a particular situation where the output becomes burden. John Kenneth Galbraith said, “Output is so prodigious that all effort concentrates on trying to get rid of it.” It indicates when a company in unplanned pattern without realizing the whole scenario of consumer demand or market condition; it faces huge trouble with the access production. Then the company tries to get rid of it by applying various old tricks like singing commercials, billboard advertising or other wasteful practices. The attempt turns the company’s strategy more selling strategy rather than marketing. Levitt said, “Marketing, a more sophisticated and complex process, get ignored”

The findings regarding the research question that, CityCell as the only CDMA operator in Bangladesh has a good hold in communication business. It also plays crucial role in case of importing the necessary sets, infrastructure materials as well as accessory regarding the technology. As a concerned company, the company realizes the procedure of business as the mean of communication. However, reasons market realizes the drop but their attempts are in progress to overcome the matter. The converting from CDMA to GSM as well as by allowing 3G license, CityCell is determined to bring back the consumer interest and right now them as the CDMA operators working on the consumers with focusing on keen knowledge (Marketing Team, CityCell, 2014)

Yet the research fact on the production can be hardly gathered through public’s view. The reason behind it is that the matter is strictly company’s internal matter and the information is not mainly asked or needed by the general mobile users. Still few questions asked through Likart scale to make a concept about consumers’ perception about the overall condition. The survey shows the matter that CityCell offered packages have moderate attraction in the mobile subscribers. Here among the 110 respondents it was found that 18.2% agreed and 11.8% strongly agreed along with large percentage of 39.1% neutral responses concerned that CityCell offers cheaper packages.

**Finding Regarding Research question04:**

“Preoccupation with a product that lends itself to carefully controlled scientific experimentation, improvement and manufacturing cost reduction.” The issues came forward with research and development that some time new companies make too much concentration on
research, sometime the company makes expensive research and sometime they concentrate the research that may focus only on their product. These are the myopia symptoms about research and development mainly found in a myopia-affected company.

The last finding regarding the research question 04 is nevertheless, in matter of CityCell, the research and development segment is free of all these symptoms as the research is a regular based work for customer care as well as marketing department and the teams are very effective to make its effort to come closer to the consumers. The surveys mainly done on consumer satisfaction, brand health tracking, retailer effectiveness, pre and post campaign research, ADHOC research and communication effectiveness research. At present the company mainly focuses on Winback and Acquisition type offers where the team surveys about the consumer’s acceptance and understanding about the research, offer’s attractiveness and acceptance to consumers, the form of media the consumers mainly get the massage and how much the offers create buzz in consumers. Each research is well surveyed and all concerns about the need and acceptance of the consumers and regarding the product. The survey is currently made upon only existing consumers and the survey conducted by the company along with other research firms. The company shows prompt and exact effort on particular survey (Marketing Team, CityCell, 2014)

Through the survey the fact is found that people moderately accept that CityCell make survey on Customer need as 25.5% disagreed and 20.5% strongly agreed the fact that CityCell makes survey on consumer need. The respondent have negative reaction regarding the fact that the company works according to the research made on consumers as 25.5% disagreed on the statement with 22.7% strongly disagreed. Around 12.7% respondents agreed that it works on the feedback of the research.

Finally, the respondents thought the future of CityCell in the telecom industry is bright as the company has its own experience and urges so it can survive the long run in the industry. The respondents near about 24.54% agreed along with 23.64% strongly believed that the company still has better future. As the decision of converting into GSM and few promising past attributions make respondents hopeful about the statement that the company has a good future upward.

6. RECOMMENDATION

The research is about marketing myopia and its influence on Bangladesh’s telecom industry where the focus was on country’s only CDMA operator CityCell. Conversely, there is one thing to mention that the researchers of our country gave no effort to work on the fact, as the subject matter is highly crucial to research and analysis. However, the research also tried to make a correlation between the conditions of marketing myopia and the business strategy of CityCell. From the broader analysis and realization, it can be recommend the followings:

From above discussed analysis, we can reach to some conclusions such as:

- CityCell to make a better position in the telecommunication business should convert into GSM technology.
- CityCell should consider getting 3G license in order to provide good service for internet users.
- CityCell should increase its network zone and offer even better service.
- CityCell should continue to maintain good relationship with both retailer and distributors.
- CityCell must have to us attacking strategy to sustain and gain market share.
CityCell must have to use its consumer relation in a intimate way

The company must have to be more innovative in approach.

More study on Marketing Myopia in Bangladesh’s perspective should be took place.

7. Conclusion:

Myopia is a business error, which is visible more or less in every industry where the companies affect by the various symptoms of it. Sometime the population sometime believes regarding competition or mass production or even research hazard can make a company even an industry suffers. The narrow vision, defensive strategy all can hamper the decision making of a company. A company must have to find out the errors or the potentiality of the errors. To evaluate the error or possibility of error occurrence can help a company to make better decision regarding strategy making. CityCell as a part of telecommunication of Bangladesh which also representing a certain industry, like every growing industry it also affected partially or by segments of marketing myopia and the error bring negative impression to the company’s growth but it also can be say that, like a consumer oriented company, it tried its best to understand and work with consumer needs. It positively shows its effort to learn from the experience and to utilize the knowledge for the future progress.

The company to prolong of long run must have to posse’s strong strategy to come out the drawback it faces. The company considers and respects the needs of customer’s demand but it have to implement the consideration with a prompt attempt. The company has to move and update its technology regarding telecommunication to make a proper sustain in market. It has to bring innovative offers and packages to attract the consumers around. It also has to make stronger competitive strategy to make the competition fiercer. As the company is on verge to leave the monopoly business of CDMA then it has to be more aware about the competition. The company shows the tendency regarding production and research is customer sensitive but lack of promotion or publication due to confidentiality it remained underdog. The company has to take these advantages as positive vibe and have to implement in future works. Along with voice services, the company must consider the service of 3G internet in its activities. The better offering makes the company more attractive to the customers. Consciously it can be said that the marketing myopia is error that the fact exists partially in some strategies in the business procedure but the wise concept and proper implementation of strong strategy can make it possible to come out from the mistakes and can bring back glorious achievements.

Though the study on the influence of marketing myopia is rare in the perspective of Bangladesh’s telecom industry so the research can be consider as an asset. While the influential existence of the conditions of marketing myopia in partial level will make the industry people to consider, the consequences of it as well as they can make a positive change on the long run strategy making decision.

Reference

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Implementation of Quality Management System of ISO 9001:2008 In Graduate School, Bogor Agricultural University

Suprihartono Kurniawan, Nurmala Katrina Panjaitan, Gendut Suprayitno
School of Business, Bogor Agriculture University (IPB), Indonesia

Abstract- Implementation of Total Quality Management makes organization to maintain quality standards in all aspects of organization's business. The standard of quality management system (QMS) that has been developed and suitable for education is ISO 9001, achievement of quality device that is expected to respond to the challenges of globalization by increasing the efficiency and effectiveness to satisfy stakeholders. Graduate School of Bogor Agricultural University (SPs-IPB) proved itself as a reliable organization that received the ISO 9001:2008 certificate issued by SUCOFINDO on June11th, 2011. This research aimed to determine the implementation of Quality Managements System ISO 9001:2008 from the aspect of documentation, management responsibility and alternative implementation strategies for corrective action. The data used in the form of primary and secondary data, both from qualitative and quantitative. Processing of qualitative data using descriptive analysis was based on interviews with party organization consisted of three informen who master the Quality Management System and its implementation in SPs-IPB on the right target and can affect policy. The collected data is processed by the method of analytic hierarchy process AHP. The results of data processing showed that the essential elements of QMS ISO 9001:2008 in SPs-IPB were Responsibility Management (43.9 %), Quality Management System (31.4 %), Product Realization (14.1%), Resource Management (6.8%), and Measurement, Analysis & Improvement (3.8 %);alternative measures such as Focus on the customer (1st priority), Quality Manual (2nd priority) and Purchase Information (3rd priority).

Index Terms - Quality management system,ISO 9001:2008, AHP

I. INTRODUCTION

Law of 1945 Article 31, paragraph 1 mandates that every citizen has a right to get education. Education in Indonesia is implemented and divided into several levels. This level is divided based on age levels and proficiency of learners, each level of education has different life span and education time. By this setting of the level of education, it facilitates the grouping of learners as well as their targets and policy concerning education, etc.

Law No. 12 of 2012 contains the objectives of higher education (Dikti) in Indonesia covers four aspects, which are; firstly, the progress of students’ potencies in order to become a human of faith and fear of God Almighty and noble, healthy, knowledgeable, skilled, creative, independent, skilled, competent, and cultured for the sake of the nation; secondly, the output of graduates who mastered the science and / or technology to meet the national interests and to improve the competitiveness of the nation; thirdly, the output of science and technology through researches that notice and apply the value of humanities in order to benefit to the development of the nation, and the development of civilization and welfare of mankind; and fourthly, the realization of service to community based on reasoning and research works that are beneficial in promoting the general welfare and educating the nation.

Government Regulation No.04 of 2014 makes operation of Dikti to guarantee the quality of higher education so that the public interest is not harmed, including in the form of organizing, planning, supervision, monitoring and evaluation as well as development and coordination of the implementation of the program, level and type of Higher Education by the Minister to achieve the goal of Higher Education. Likewise with the demands of university administrators (PT), that in running the universities, they must be able to guarantee the autonomy of PT can be properly implemented that covers the autonomy of PT, the management of PT, the governance of PT and the public accountability. These all are performed to achieve the goal of the higher education.

The regulation of the Minister of Education and Culture No. 50 of 2014 Article 2 states that (1) The System of Quality Assurance of Higher Education aims to ensure the compliance with the Higher Education Standards in systemic and sustainable manner, so that it grows and develops quality culture. (2) The System of Quality Assurance of Higher Education functions to control the implementation of higher education by universities to have the high-quality of higher education.

Quality is a philosophy and methodology that assists institutions to plan change and set the agenda in the challenge of excessive external pressure. Quality is defined as something that satisfy and exceed customer needs and requirements. Improved quality is becoming increasingly important for institutions to obtain better control (Sallis, 2010: 15). Juran (Heizer & Render, 1993: 12) defines quality as a fitness in product use. Furthermore Juran (Atamadi, 2010: 28) states that quality as a result of production, either goods or services, successfully meets customer satisfaction and defect-free. According to Widodo (2011: 6), the quality is a dynamic thought that is difficult to be uniform. On the one hand, the quality can be understood as an absolute concept and on the other hand can be understood as a relative concept: (a) The Absolut Concept: Quality will be a symbol of status for internal and external customers, so that stakeholders
Implementation Procedures. The study found that the Planning Implementation Procedures have been very well perceived by Certification Planning of ISO 9001, Company Commitment and ISO toward the Employee Performance through Quality Culture on the Influence of the Quality Management System (QMS) of Samuel and Zulkarnaen (2006) conducted a study entitled standards is the quality results of a product is well-maintained, management. The point of the implementation of quality providing guidance on auditing QMS and environment QMS requirements of an organization; (3) ISO 9004: 2000 providing guidance for sustainable improvement in performance (1) ISO 9000: 2005 describing fundamentals of SMM and detailing terms used in SMM; (2) ISO 9001: 2008 specifying the QMS requirements of an organization; (3) ISO 9004: 2000 providing guidance for sustainable improvement in performance and overall efficiency of the organization; (4) ISO 1901: 2002 providing guidance on auditing QMS and environment management. The point of the implementation of quality standards is the quality results of a product is well-maintained, which is a knowledge sharing system that allows everyone to produce the same thing with the same quality, so it will reduce the dependence on one person (Wangtrey, 2009).

Amirudin (2014) in general and complete, quality management can be defined as: Quality management is a systematic effort through the planning, implementation, inspection or control and follow-up on all elements of the organization, both internally and externally covered in the dimensions of materials, methods, machines, funds, human, environment and information to realize the commitment, policy and quality objectives which have been set in order to give satisfaction to the customers both in the present and in the future.

One of the standard of quality management system (QMS) that has improves is ISO 9001. ISO 9001 version of 2000 and version of 2008 give more emphasis on business process patterns that occur within the company's organization. Thus almost all types of businesses can implement this quality management system of ISO 9001 (Hendartho, 2014). One of the Quality Management System which aims to enhance customer satisfaction, enabling sustainable improvement, is ISO 9001: 2008. Certification of ISO 9001: 2008 (QMS) is the standard generic and can be applied throughout the organization. In order to increase the accountability and the international public image, the Ministry of National Education has implemented a policy that every major unit of organization in both central and local work units to achieve ISO 9001: 2008 as an evidence of international recognition of education in Indonesia.

Widodo (2011) explained that the ISO version that is much highlighted by the education world is ISO 9000, which is the newest version that was published in 2008 and include four series (1) ISO 9000: 2005 describing fundamentals of SMM and detailing terms used in SMM; (2) ISO 9001: 2008 specifying the QMS requirements of an organization; (3) ISO 9004: 2000 providing guidance for sustainable improvement in performance and overall efficiency of the organization; (4) ISO 1901: 2002 providing guidance on auditing QMS and environment management. The point of the implementation of quality standards is the quality results of a product is well-maintained, which is a knowledge sharing system that allows everyone to produce the same thing with the same quality, so it will reduce the dependence on one person (Wangtrey, 2009).

Samuel and Zulkarnaen (2006) conducted a study entitled on the Influence of the Quality Management System (QMS) of ISO toward the Employee Performance through Quality Culture Company, with PT Otsuka Indonesia Malang as the object of study. QMS ISO is seen from three dimensions, that are Certification Planning of ISO 9001, Company Commitment and Implementation Procedures. The study found that the Planning Certification of ISO 9001, Company Commitment and Implementation Procedures have been very well perceived by employees and gave a positive and significant effect on the company Quality Culture. Further, Quality Culture gave positive and significant effect on employee performance, yet still be perceived not too good by employees, because the Empowerment and Involvement and Quality Improvement Team Work have not been implemented optimally.

Dharma (2007) did a study trying to see if there is influence of the quality management system of ISO 9001: 2000 to employees performance in PT Asuransi Prog Branch of North Sumatra. The results of this study showed that, simultaneously and partially, the quality management system of ISO 9001: 2000 gave very significant and positive effect on the employee performance. This means that every policy carried out by the company has been fit with the quality assurance system of ISO 9001: 2000.

Irani and Hadiputra (2010) in their study on the influence of the implementation of the quality management system of ISO 9001: 2008 in PT Telkom on employee performance. The results of this study showed that, simultaneously, the quality management system of ISO 9001: 2008 gave very significant and positive effect on employee performance in PT Telkom. This means that every policy carried out by the company has been fit with the quality management system of ISO 9001: 2008.

Lestari (2012) in this study sought to observe how the influence of quality assurance to performance. The results showed that the implementation of the system of internal quality assurance and quality management systems of ISO had implications for improved performance.

Amirudin (2014) that is based on the explanation of the various results of previous studies can be concluded that the implementation of quality management system of ISO 9001: 2008 has a good influence on employee performance, it has become imperative for educational users or providers to make fundamental changes, both the processes and outputs of education and the management system of educational administration. This is in accordance with the findings in this study, although there are some aspects that still need to be fixed and the service to be increased. Regular evaluation is important to show that the quality assurance system that is implemented can improve the quality of educational services to students, faculty, and educational staff in the UIN Syarif Hidayatullah Jakarta.

Therefore, the Graduate School of Bogor Agricultural University has struggled to implement ISO 9001: 2008 so that in the implementation of the administrative services process of education for the achievement of the management system of educational administrative that is excellent, fast and efficient can be in accordance with customers’ expectations and supports the process of excellent implementation of education in the Graduate School of Bogor Agricultural University. The scope defined in the implementation of the Quality Management System of ISO 9001: 2008 is in the process of "educational administration services started from the file admissions process until the file submission process", particularly in the service of Certificate Active, Permit Research, Validation Proposal, Legalization Proposal, Thesis or Dissertation Validation, Certificate of graduation, Return Letter to the Institute. The purpose of this adoption of Quality Management System is an effort to organize educational administrative services at the Graduate School of...
Bogor Agricultural University that is excellent and in accordance with the customers’ expectations, and also match the laws to support education and teaching. Related to the background of quality management in performance in higher education, then it needs to conduct a study to determine the implementation of QMS ISO 9001: 2008 in the Graduate School-IPB.

II. RESEARCH METHODS

This study used a qualitative approach (expert judgment). Researchers conducted interviews (questionnaire), which is the primary data. In addition, researchers also observed internal documentations of SPs-IPB and literatures about the implementation of ISO 9001: 2008 which is secondary data as shown in Table 1.

### Table 1 Data collection techniques

<table>
<thead>
<tr>
<th>No</th>
<th>Source of data</th>
<th>Data (that is needed)</th>
<th>Technique of collecting</th>
<th>Types of Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Academics Respondent (Expert)</td>
<td>Things related to the implementation of ISO 9001: 2008 at Graduate School’s Academic Administration Section</td>
<td>- Exper</td>
<td>Primary Data</td>
</tr>
</tbody>
</table>

The results of this study informed how the implementation of ISO 9001: 2008 in SPs-IPB through study of agreements of QMS ISO 9001: 2008. The analytical tool used in the identification of the implementation of ISO 9001: 2008 was Analysis Hierarchy Process (AHP).

According to Saaty (1993) Analytical Hierarchy Process (AHP) is a common tool used in the decision-making in the compound criteria. AHP is a functional hierarchy with the main input of human perception. With AHP, complex and unstructured problems will be grouped and arranged into a form of hierarchy. Since all parts of the hierarchy are interconnected, it will be very easy to see how a change in one perspective will give effects on other perspectives.

**Technique of Comparative Performance Index (CPI)**

The technique of comparative performance index is a composite index that can be used to determine the rating or ranking of the various alternatives (i) based on several criteria (j). The formula used in the technique of CPI is as follows:

$$A_{ij} = \frac{X_{ij}(\text{min})}{X_{ij}} \times 100$$
$$A(i+1j) = \frac{(X(I+Ij))}{X_{ij}(\text{min})} \times 100$$
$$I_{ij} = A_{ij} \times P_j$$
$$I_i = \sum_{i=1}^{n} (I_{ij})$$

**Explanation:**

- $A_{ij}$: alternative value to-i at the criteria to-j
- $X_{ij}(\text{min})$: alternative value to-i at the minimum initial criteria to-j
- $A(i+1j)$: alternative value to-i + 1 at the criteria to-j
- $X(I+Ij)$: alternative value to-i + 1 at the minimum initial criteria to-j
- $P_j$: importance quality of criteria to-j
- $I_{ij}$: alternative index I
- $I_i$: criteria composite index at the alternative to-I
- $i$, $j$: 1, 2, 3, ..., n, m

In this study, the CPI was used to assess the interest quality between sub-agreement in ISO 9001: 2008.

Hierarchical structure model used in this study: The first level is the goal, that is the implementation of QMS ISO 9001: 2008 in SPs-IPB. The second level is the element that consists of five factors, that are SMM, management responsibility, resource management, product realization, also analysis, measurement and improvement. These five factors are the agreements in QMS ISO 9001: 2008. The analysis of the value of the sub-agreements of QMS ISO 9001: 2008 was analyzed using the results of AHP and Technique of Comparative Performance Index.

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III. RESULTS AND DISCUSSION

The results of AHP processing showed that agreement of QMS ISO 9001: 2008 in SPs -IPB was the Management Responsibility (43.9%), Quality Management Systems (31.4%), Product Realization (14.1%), Resources Management (6.8%) and Measurement, Analysis and Improvement (3.8%), with the inconsistency of 0.09 as shown in Table 2.

Table 2 Structure of agreement priority of SMM ISO 9001:2008 in SPs IPB

<table>
<thead>
<tr>
<th>Element</th>
<th>Quality Value</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Responsibility</td>
<td>43.9%</td>
<td>1</td>
</tr>
<tr>
<td>Quality Management Systems</td>
<td>31.4%</td>
<td>2</td>
</tr>
<tr>
<td>Product Realization</td>
<td>14.1%</td>
<td>3</td>
</tr>
<tr>
<td>Resources Management</td>
<td>6.8%</td>
<td>4</td>
</tr>
<tr>
<td>Measurement, Analysis and</td>
<td>3.8%</td>
<td>5</td>
</tr>
<tr>
<td>Improvement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Analysis results of AHP

From these five agreements, the main agreement to be considered prioritized to the successful implementation of QMS ISO 9001: 2008 in SPs IPB is by selecting the highest quality value as the main priority. The agreement of Management Responsibility became the main agreement that get the priority of success. According to experts, the agreement of management responsibilities become a priority because it becomes the determinant of ISO achievement goal, as the charge for the implementation of SMM and the success of SMM depends on management responsibilities.

This agreement becomes important because in the management responsibility, the top management must provide evidence of management commitment to the forming and implementation of QMS and also the sustainable correction effectiveness. Correction effectiveness is sustainable by communicating to the SPs the importance of meeting the requirements of QMS ISO 9001: 2008, determining the quality policy, ensuring that quality objectives, conducting management reviews and ensuring the availability of resources.

The agreement of Quality Management System from the results of the technique of the variables comparative performance index that had a high priority and played a role in influencing the results of QMS ISO 9001: 2008, implemented by the Graduate School of IPB was sub agreement of the documentation requirements focused on the quality manual. The quality manual here includes a) the scope of the quality management system, including detailing the exception of the terms or procedures of the educational administrative services started from the file admissions process until the file submission process. b) Includes also the procedure documentation of existing processes within the quality management system, and c) describes carefully the interactions that occur in the process of quality management.

Table 3. Interest priority in agreement of the quality management system

<table>
<thead>
<tr>
<th>Agreement</th>
<th>ISO 9001:2008</th>
<th>Score</th>
<th>Quality Value</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1</td>
<td>General Requirements</td>
<td>6.67</td>
<td>111</td>
<td>34.89</td>
<td>Option</td>
</tr>
<tr>
<td>4.2</td>
<td>Documentation Requirements</td>
<td>7.33</td>
<td>122</td>
<td>38.38</td>
<td>Alternative</td>
</tr>
<tr>
<td>4.2.1</td>
<td>General</td>
<td>6.67</td>
<td>111</td>
<td>34.89</td>
<td>Option</td>
</tr>
<tr>
<td>4.2.2</td>
<td>Quality Manual</td>
<td>7.67</td>
<td>128</td>
<td>40.12</td>
<td>Priority</td>
</tr>
<tr>
<td>4.2.3</td>
<td>Control of Documents</td>
<td>6.67</td>
<td>111</td>
<td>34.89</td>
<td>Option</td>
</tr>
<tr>
<td>4.2.4</td>
<td>Control of Records</td>
<td>6.00</td>
<td>100</td>
<td>31.40</td>
<td>Option</td>
</tr>
</tbody>
</table>

The agreement of Management Responsibility from the results of the technique of variable performance index that had a high priority and played a role in influencing the results of QMS ISO 9001: 2008, implemented by the Graduate School of IPB was a variable of focus on the customer. Focus on the customer means the central leader / leader of the organization must ensure...
that the conditions of service of educational administration started from the file admissions process until the file submission process was set and fulfilled with the aim to increase the satisfaction of stakeholders. In addition to the focus variable on customers, variable that became a priority interest in this agreement that can also be used as an alternative that can influence the results of QMS ISO 9001: 2008 was the variable of responsibility, authority and communication. The responsibility and authority defined in this variable is that the top leadership of the Graduate School of IPB must ensure that the responsibilities and authorities in QMS ISO 9001: 2008 have been defined and communicated as they should be

Table 4. Interest priority in agreement of management responsibility

<table>
<thead>
<tr>
<th>Agreement ISO 9001:2008</th>
<th>Score</th>
<th>Quality Value</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Responsibility</td>
<td>0.439</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Management Commitment</td>
<td>7.00</td>
<td>105</td>
<td>46.07</td>
<td>Option</td>
</tr>
<tr>
<td>5.2 Focus On Customer</td>
<td>8.67</td>
<td>130</td>
<td>57.04</td>
<td>Priority</td>
</tr>
<tr>
<td>5.3 Quality Policy</td>
<td>7.33</td>
<td>110</td>
<td>48.27</td>
<td>Option</td>
</tr>
<tr>
<td>5.4 Planning</td>
<td>6.67</td>
<td>100</td>
<td>43.88</td>
<td>Option</td>
</tr>
<tr>
<td>5.4.1 Quality Objective</td>
<td>7.33</td>
<td>110</td>
<td>48.27</td>
<td>Option</td>
</tr>
<tr>
<td>5.4.2 Planning of Quality Management System</td>
<td>7.00</td>
<td>105</td>
<td>46.07</td>
<td>Option</td>
</tr>
<tr>
<td>5.5 Responsibility, Authority, and Communication</td>
<td>8.00</td>
<td>120</td>
<td>52.65</td>
<td>Alternative</td>
</tr>
<tr>
<td>5.5.1 Responsibility and Authority</td>
<td>8.00</td>
<td>120</td>
<td>52.65</td>
<td>Alternative</td>
</tr>
<tr>
<td>5.5.2 Management Representative</td>
<td>7.67</td>
<td>115</td>
<td>50.46</td>
<td>Option</td>
</tr>
<tr>
<td>5.5.3 Internal Communications</td>
<td>7.67</td>
<td>115</td>
<td>50.46</td>
<td>Option</td>
</tr>
<tr>
<td>5.6 Management Review</td>
<td>7.33</td>
<td>110</td>
<td>48.27</td>
<td>Option</td>
</tr>
<tr>
<td>5.6.1 General</td>
<td>7.33</td>
<td>110</td>
<td>48.27</td>
<td>Option</td>
</tr>
<tr>
<td>5.6.2 Input for the Management Review</td>
<td>7.00</td>
<td>105</td>
<td>46.07</td>
<td>Option</td>
</tr>
<tr>
<td>5.6.3 Output of the Management Review</td>
<td>7.00</td>
<td>105</td>
<td>46.07</td>
<td>Option</td>
</tr>
</tbody>
</table>

The agreement of Resources Management from the results of the technique of variable performance index that had a high priority and played a role in influencing the results of QMS ISO 9001: 2008, implemented by the Graduate School of IPB was a variable of human resources. Personnels who work affecting the conformity to product requirements must be competent on the related basis of education, training, skills and experience. SPs IPB, in this matter, should defines the competence needed by personnels who perform work affecting the conformity to product requirement, if necessary providing training or taking other actions to achieve the competence needed. SPs IPB should assess the effectiveness of the actions taken care by personnels and ensure the appropriateness and importance of their activities and how they contribute to the achievement of quality objectives. SPs IPB should also maintain the records that are needed and have been implemented on education, training, skills and experience of what is appropriate.

Table 5. Interest priority in agreement of resource management

<table>
<thead>
<tr>
<th>Agreement ISO 9001:2008</th>
<th>Score</th>
<th>Quality Value</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Management</td>
<td>0.068</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1 Provision of Resources</td>
<td>7.00</td>
<td>105</td>
<td>7.14</td>
<td>Option</td>
</tr>
<tr>
<td>6.2 Human Resources</td>
<td>7.67</td>
<td>115</td>
<td>7.82</td>
<td>Alternative</td>
</tr>
<tr>
<td>6.2.1 General</td>
<td>7.33</td>
<td>110</td>
<td>7.48</td>
<td>Option</td>
</tr>
<tr>
<td>6.2.2 Competence, Training and Awareness</td>
<td>8.33</td>
<td>125</td>
<td>8.50</td>
<td>Priority</td>
</tr>
<tr>
<td>6.3 Infrastructure</td>
<td>6.67</td>
<td>100</td>
<td>6.80</td>
<td>Option</td>
</tr>
<tr>
<td>6.4 Work Environment</td>
<td>6.67</td>
<td>100</td>
<td>6.80</td>
<td>Option</td>
</tr>
</tbody>
</table>
The agreement of Product Realization from the results of the technique of variable performance index that had a high priority and played a role in influencing the results of QMS ISO 9001: 2008, implemented by the Graduate School of IPB was the variable of purchase that focused on the purchase information. In the world of education, it is translated as documents concerning qualification requirements of stakeholders, the requirements of the procedures, processes and equipment needed.

Table 6. Interest priority in agreement of product realization

<table>
<thead>
<tr>
<th>Agreement ISO 9001:2008</th>
<th>Score</th>
<th>Quality Value</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Realization</td>
<td>0.141</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1 Planning of Product Realization</td>
<td>6.67</td>
<td>100</td>
<td>14.09</td>
<td>Option</td>
</tr>
<tr>
<td>7.2 Processes Associated with Customer</td>
<td>7.33</td>
<td>110</td>
<td>15.50</td>
<td>Option</td>
</tr>
<tr>
<td>7.2.1 Determination of Terms Relating to Product</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
<tr>
<td>7.2.3 Customer Communication</td>
<td>6.67</td>
<td>100</td>
<td>14.09</td>
<td>Option</td>
</tr>
<tr>
<td>7.4 Purchase</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
<tr>
<td>7.4.1 Purchase Process</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
<tr>
<td>7.4.2 Purchasing Information</td>
<td>8.00</td>
<td>120</td>
<td>16.91</td>
<td>Priority</td>
</tr>
<tr>
<td>7.4.3 Verification of purchased product</td>
<td>7.00</td>
<td>105</td>
<td>14.80</td>
<td>Option</td>
</tr>
<tr>
<td>7.5 Production and Service Provision</td>
<td>7.33</td>
<td>110</td>
<td>15.50</td>
<td>Option</td>
</tr>
<tr>
<td>7.5.1 Control of Production and Service Provision</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
<tr>
<td>7.5.2 Delivery</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
<tr>
<td>7.5.3 Identification and Testing Capability</td>
<td>6.67</td>
<td>100</td>
<td>14.09</td>
<td>Option</td>
</tr>
<tr>
<td>7.5.4 Customer Property</td>
<td>6.67</td>
<td>100</td>
<td>14.09</td>
<td>Option</td>
</tr>
<tr>
<td>7.5.5 Preservation of Product</td>
<td>7.67</td>
<td>115</td>
<td>16.21</td>
<td>Alternative</td>
</tr>
</tbody>
</table>

The agreement of Measurement, Analysis and Improvement from the results of the technique of variable performance index that had a high priority and played a role in influencing the results of QMS ISO 9001: 2008, implemented by the Graduate School of IPB was the variable of improvement and preventive action. SPs IPB should determine action to eliminate the causes of potential nonconformities to prevent their occurrence. Preventive action should be appropriate to the influence of the potential problems.

Table 7. Interest priority in agreement of measurement, analysis and improvement

<table>
<thead>
<tr>
<th>Agreement ISO 9001:2008</th>
<th>Score</th>
<th>Quality Value</th>
<th>Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement, Analysis and Improvement</td>
<td>0.038</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.1 General</td>
<td>6.33</td>
<td>106</td>
<td>4.01</td>
<td>Option</td>
</tr>
<tr>
<td>8.2 Monitoring and Measurement</td>
<td>6.67</td>
<td>111</td>
<td>4.22</td>
<td>Option</td>
</tr>
<tr>
<td>8.2.1 Customer Satisfaction</td>
<td>6.67</td>
<td>111</td>
<td>4.22</td>
<td>Option</td>
</tr>
<tr>
<td>8.2.2 Internal Audit</td>
<td>6.67</td>
<td>111</td>
<td>4.22</td>
<td>Option</td>
</tr>
<tr>
<td>8.2.3 Monitoring and Process Measurement</td>
<td>6.00</td>
<td>100</td>
<td>3.80</td>
<td>Option</td>
</tr>
<tr>
<td>8.2.4 Monitoring and Product Measurement</td>
<td>6.33</td>
<td>106</td>
<td>4.01</td>
<td>Option</td>
</tr>
<tr>
<td>8.3 Product Control that do not fit</td>
<td>6.33</td>
<td>106</td>
<td>4.01</td>
<td>Option</td>
</tr>
<tr>
<td>8.4 Data Analysis</td>
<td>6.67</td>
<td>111</td>
<td>4.22</td>
<td>Option</td>
</tr>
<tr>
<td>8.5 Improvement</td>
<td>7.33</td>
<td>122</td>
<td>4.64</td>
<td>Priority</td>
</tr>
<tr>
<td>8.5.1 Sustainable Improvement</td>
<td>6.67</td>
<td>111</td>
<td>4.22</td>
<td>Option</td>
</tr>
<tr>
<td>8.5.2 Corrective Action</td>
<td>7.00</td>
<td>117</td>
<td>4.43</td>
<td>Alternative</td>
</tr>
<tr>
<td>8.5.3 Preventive Action</td>
<td>7.33</td>
<td>122</td>
<td>4.64</td>
<td>Priority</td>
</tr>
</tbody>
</table>
IV. CONCLUSION AND RECOMMENDATION

Conclusion

The result of AHP processing and the technique of Comparative Performance index (CPI) from the agreements in the QMS ISO 9001: 2008 illustrates that high priority in each agreement has been implemented as it should be, in accordance with the terms and procedures. For the agreement of management responsibility in this regard the existing leader of the units in the Graduate School should be properly and truly committed to implement the QMS ISO 9001: 2008 for the realization of the process, implementation procedure and sustainable improvement of the educational administration which start from the file admissions process until the file submission process defined and fulfilled in accordance to the target procedure to increase the satisfaction of stakeholders.

Suggestion

The high quality value to the agreement of management responsibility of QMS ISO 9001: 2008 shows that the management responsibility is very important to the success of the implementation of QMS ISO 9001: 2008 in the Graduate School of IPB. Therefore, the role of management, in this respect, the leaders of SPs should prove their commitment to the forming and implementation of QMS by performing efficient communication, performing the quality policy that has been assigned, setting the quality objectives, performing management reviews and ensuring the availability of resources needed. Leaders of the Graduate School have an obligation to carry out internal audits every 3 months and the leaders of management who have been certified ISO 9001: 2008 must carry out the surveillance audit every 6 months, because of the existing data, QMS ISO 9001: 2008 in the Graduate School of IPB had ever performed surveillance audit. According to the rules of QMS ISO 9001: 2008, if the institution that has been certified of ISO does not carry out surveillance audit procedure for 2 times, then its ISO certificate is no longer valid.

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Survey: Designing Curriculum for Outcome Based Education

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Abstract: In the outcome based education system, universities focus on outcome of student’s technical competence, professional skills. Due to Changes in the curriculum of outcome based education (OBE), this has been an on-going need to be addressed and practiced by the institution to consistently generate well groomed learners suitable for industry. The high demand of industry on their potential employees with good technical competence and professional skills continuously drive the need for change.[1] All curriculum and teaching decision are made based on desired outcome.

The main aim of this paper is survey stakeholders for building, refining and restructuring Program Educational Objectives in-line with Graduate Attributes. The graduate attributes are the things which need to be considered in outcome based education, these attributes need to be taken from the source which requires outputs of outcome based education. Those are IT industries, professional bodies etc. our survey system generates the templates for different stakeholders and when those stakeholders gives responses, it stores them and generates the reports from which the graduate attributes can be extracted and those becomes the Program objectives for outcome based education.

Index Terms
Outcome based Education(OBE),Survey tool, Design Curriculum, PEO-Program Educational Objectives ,PO- Program Outcome, CLO- Course Learning Objectives, TLO-Topic Learning Objectives

1. Introduction
Earlier all the educational institution use to focus on syllabus set by some experienced people or professional bodies in particular fields, but those type of curriculum didn’t work well to provide the graduates with successful carrier in their professional life. The history of outcome based education

In traditional educational system students are given grades based on how much they score in the assessments conducted for what they are thought in classroom sessions. here some student score well and other score below average.

In this system this type of variation in scores of student is thought as normal and unavoidable.

Outcomes based education (OBE) is a process that involves the restructuring of curriculum, assessment and reporting practices in education to reflect the achievement of high order learning and mastery rather than the accumulation of course credits” (Tucker, 2004). Thus the primary aim of OBE is to facilitate desired changes within the learners, by increasing knowledge, developing skills and/or positively influencing attitudes, values and judgment. OBE embodies the idea that the best way to learn is to first determine what needs to be achieved. Once the end goal (product or outcome) has been determined the strategies, processes, techniques, and other ways and means can be put into place to achieve the goal. [2]

Main task of institutions, if they want to follow OBE method for curriculum design then they need to know what are the different expectations of industry or employer outside the institution for hiring their students. Cudos (Curriculum Design for Outcome Based Education) -Survey is a tool which helps to get graduate attributes or PEO’s (Program Educational Objectives) as its output.

In the current modern society almost every technical education tends to establish an Outcome Based Education (OBE) system. OBE is a method of curriculum designand teaching that focuses on what studentscan actually do aftercourse completion. It identifies the real needs of Industry and society’s and revision the curriculum to suit the changing needs of the Stakeholders (Industry, Alumni, Academia, Professional bodies).

Elements of Outcome Based Education (OBE)

1) Program Educational Objectives (PEO)
2) Program Outcomes(PO)
3) Course Learning Objectives (CLO)
4) Topic Learning Objectives (TLO)
Program Educational Objectives (PEO): Expected achievements of graduates within the first few years of their graduation from the program.

- Ascertaining prerequisite knowledge or skills to attain goals (outcomes)
- A flexible timeframe to attain goals (outcomes)
- Using different media and materials to create enriched teaching/learning contexts
- Formative evaluation to provide feedback for both teaching and learning improvement

2.3 Competency based education

Competency based education was introduced in the 1960s in North America in response to growing concerns that students were not being taught what they required after they left school. Malan (2000) summarizes the following components from the competency based literature, noting their prominent in OBE[7]:

- Explicit learning outcomes with respect to the required skills and concomitant proficiency (standards for assessment)
- A flexible timeframe to master skills
- A variety of instructional activities to facilitate learning
- Criterion referenced testing of the required outcomes
- Certification based on demonstrated learning outcomes
- Adaptable programmes to ensure optimum learner guidance
- Support for the notion the learner is accountable for his or her own achievement

2.4 Glaser’s criterion-referenced learning:

In 1963, Glaser described criterion-referenced measurement as that which locates a student’s test behaviour on a continuum ranging from “no proficiency” to “perfect performance”. Criterion-reference instruction and assessment is based on attaining specific outcomes and on testing for competence in terms of stated criterion. This form of instruction compares a learning outcome or mastery of competencies with a predetermined external standard. Success is measured by demonstration of standards followed by remedial intervention as required. Criterion-referenced assessment is the preferred mode of assessment in OBE.[9]

2.5 Spady’s OBE

Spady’s OBE approach closely resembles Mager’s (1962) guidelines in terms of expected performance, conditions under which it is attained and standards for assessed quality. OBE learning programme assessment and learner’s competence can be compared to specific criteria. Competence in the required outcome (learner behaviors) is demonstrated by culminated of significant learning within a context, and specific timeframe required by the individual learner.
3. Importance of Survey in Designing Curriculum For Outcome Based Education:

Designing curriculum for outcome based education for an institution with effective graduate attribute, need some tool which will help them to in deciding the graduate attributes for particular academic year.

Outcome based education prepares the student to be successful at the end of their learning experience. Institution doesn’t think education for student as only lecture, assessment and projects. But they need to make student as a person who can survive in his professional life with learning he had got from institution.

Institution can make student successful only when they know what is that required for a student to be successful professional. For that they need to do as IT industries, professional bodies what are they expect from a graduate from an institution. Here comes the place for survey to know that information.

Let’s consider “how the survey helps to decide on graduate attributes”? first we need to create a template which specifies the need of IT industry and professional bodies, template may consists of set of question which will be answered by stakeholders(person from IT Industry, professional bodies like IEEE). Based on responses given by the stakeholders the reports are generated to extract the graduate attributes.

All the reports generated from survey is stored and this stored information is the source of graduate attributes or program educational objectives(PEO’s). these graduate attributes are taken as base for designing the curriculum and then it continuous in designing program objectives, course learning objectives (CLO’s), topic learning objectives(TLO’s).

4. Proposed Survey System For Designing Curriculum For Outcome Based Education:

The proposed system providing statistical data about the industry needs for designing the outcome based education.

Fig.2: curriculum design Process in OBE

Above is the larger picture of CUDOS survey system. Survey tool is indicated as a component of the entire system. The CUDOS survey consists of admin and program owner roles. Admin is person who create template for survey at the level of institution. program owner, who create and host the survey while creating the survey he selects program and stakeholder for survey. Next he selects the template, based on requirement at the department level he modifies the template which was created by admin.

After creation of survey program owner host the survey, here hosting the survey means mail will be sent to all selected stakeholder with a template. The stakeholder participates in survey by responding to survey by answering the questions in the template. All responses of stakeholder are collected and stored, using which survey report are generated. Survey reports are analyzed and parsed to extract for generating PEO’s.

Pictorial representation of above description is shown in Fig.3
For doing survey we consider two type of templates, those are Fresh and Feedback. In survey Fresh templates are used for designing curriculum, Feedback templates are used for restructuring and refining curriculum in OBE.

Fig.4 shows the format of template used in CUDOS-Survey. Once the stakeholder get template, they respond to survey by giving the feedback. This feedback can be represented in graphical notation as shown in Fig.5. And stakeholder can give suggestion in term of description, using this description some of the important keyword can be extracted and can be used in forming the PEO’s.

5. Conclusion
In this paper, we proposed survey model which generates the PEO’s based on responses given by the stakeholder. Survey responses are patrician into fresh report and feedback report based on the requirement to restructure, refine and build new PEO’s. The proposed CUDOS-Survey system is implemented with open source technology like PHP (CodeIgniter), MYSQL,
jQuery and JavaScript. The whole application flow is shown in Fig.3. In future we would like to add artificial intelligence to CUDOS-Survey, so that it removes all the manual work from existing system.

6. Acknowledgement
The authors are thankful to the following faculty, Prof Vidhya Handur and Prof G.S. Hanchinamani for support used to conduct this work.

7. References


[2] Mollie Butler, RN, PhD OUTCOMES BASED/ OUTCOMES FOCUSED EDUCATION


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Prevalence of Overweight and Obesity in Elderly people from Kg Baru-Sepang, Selangor, Malaysia

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Abstract- Overweight is an increasing health problem in the world. It is associated with the development of diabetes mellitus, coronary heart disease, hypertension and osteoarthritis. The objectives of this study were to determine the prevalence of overweight and diseases related, among the elderly population in Kg. Baru, Sepang, Selangor and to identify their self-conscious on weight status. A descriptive cross-sectional study was conducted on elderly persons, who consented to participate. The prevalence of overweight and obese were 34% and 30%, respectively. Majority of the overweight respondents were diabetic (61.1%), whereas among the obese elderly 72.2% were having hypertension. Among the elderly respondents with overweight and obese, 83.3% and 62.5% respectively, were not conscious about their own body weight status and it was statistically significance (p < 0.05). It is crucial for this group of subjects to have their weight reduced by methods such as dietary control and physical exercise. Health education should also be targeted on this aspect.

Index Terms- overweight, obese, elderly, diabetes mellitus, hypertension, self-conscious

I. INTRODUCTION

In 2014, a Lancet study estimated that the number of overweight adults in the world was 2.1 billion in 2013, compared with 857 million in 1980. The rate of obesity also increases with age at least up to 50 or 60 years old. A study among elderly in Spain shows, the prevalence of overweight and obesity in men was 49% and 31.5%, respectively, whereas the corresponding percentages in women were 39.8% and 40.8%. The prevalence of overweight and obesity was also high (41.8% and 23.4%, respectively) in Brazil. In Malaysia, the National Health Morbidity Survey revealed that the overweight prevalence among respondents more than 60 years old are increasing from 36% (2011) to 36.9% (2015), whereas the prevalence of obesity maintained at 16%.

People who are obese, compared to those with a normal or healthy weight, are at increased risk for many serious diseases and health conditions, as it is associated with poorer mental health outcomes, reduced quality of life, and the leading causes of death in worldwide, including diabetes, heart disease, stroke, and some types of cancer. World Health Organization has classified health problems associated with obesity as either nonfatal or life threatening. The life-threatening illnesses related to obesity include cardiovascular disease or conditions associated with insulin resistance, such as type 2 diabetes; certain types of cancers, especially hormonally related and large-bowel cancer; and gallbladder disease. Older age and obesity are two of the most powerful risk factors for uncontrolled hypertension and is a major determinant of mortality and stroke incidence, particularly in senior years. Obesity is also significantly and independently associated with an increase in the prevalence of type 2 diabetes and hypertension, in all ages, including old age. The National Health Morbidity Survey 2015 also revealed that there is an increasing in prevalence of known diabetes mellitus among adult more than 60 year old, from 36% (2011) to 38.3% (2015). Whereas the hypertension prevalence is increasing from 32.7% (2011) to 37.1% (2015).

Both elderly men and women who are overweight or obese at age 65 in U.S., had worse health outcomes than the normal weight cohorts. This place significant financial burdens on the U.S. healthcare system, where the elderly men who are overweight or obese at age 65 had 6–13% more lifetime health care expenditures than the same age cohort within normal weight range at age 65. Whereas, elderly women who were overweight or obese at age 65 spent 11–17 percent more than those in a normal weight range. Medical costs associated with overweight and obesity may involve direct cost such as preventive, diagnostic, and treatment services related to obesity, and indirect cost, which includes productivity.

A study in Southern city of Turkey shows that the percentage of girls defining their body weight as overweight and obese is significantly higher than the boys (p = 0.0001). The intention (p = 0.0001) and interventions to lose weight are also significantly
higher in girls than boys.\textsuperscript{14} The appropriate weight perception is directly associated with actual weight, education, occupation and income, and that it is more frequent among women than among men too.\textsuperscript{15}

Therefore, with a strong positive relationship between higher BMI and increased medical care expenditure,\textsuperscript{16} and the odds ratio for the overweight and obese (compared to normal weight) to be 1.59 and 3.44, respectively for diabetes, 1.82 and 3.50, respectively for high blood pressure,\textsuperscript{17} the objectives of this study were to estimate the prevalence of overweight and obesity and to identify self-conscious on weight status in a representative sample of the elderly population in Kg Baru Sepang, Selangor.

II. RESEARCH ELABORATIONS

A descriptive cross-sectional study was conducted in Kg Baru Sepang, Selangor. The area has multiracial community but majority consists of Chinese ethnicity, with different socio-economic backgrounds. Universal sampling was done. All Malaysian who were 60 years old and above, not mentally retarded, deaf and mute, understand Malay language and stayed more than six months were selected as respondents. A face to face interview session using a questionnaire was done on elderly respondents, who consented to participate. The questionnaire included data on socio-demographic characteristics and self-consciousness on their weight status.

Body Mass Index (BMI) measurement was obtained based on WHO international standard for adult.\textsuperscript{18} The respondent was classified as having overweight if BMI measured 25-29.9 kg/m\textsuperscript{2} and obese if BMI measured at least 30 kg kg/m\textsuperscript{2}. Systolic and diastolic blood pressure (BP), were taken with respondent sitting on a chair after at least five minutes of rest.\textsuperscript{19} The respondent was classified as at risk if BP measured 120/80–139/89 mmHg and hypertension if BP more than 139/89 mmHg. All measurements of blood pressure were taken twice with five minute interval. The average value was used for data analysis. Random blood sugar measurement was adapted from Clinical Practice Guideline (CPG) for Management of Type 2 Diabetes Mellitus.\textsuperscript{20} The respondent was at risk if RBS measured 7.0-11.0 mmol/l and having diabetes mellitus if RBS more than 11.0 mmol/l.

Data was analysed using “Statistical Package for Social Sciences (SPSS) version 20. Fishers’ Exact Test analyses the association between self-conscious status (independent variable) and weight status (dependent variable).

III. FINDINGS

Fifty three respondents, who were 60 and above, have agreed to participate in this study. There were 28 (53\%) males and 25 (47\%) females. Eighty-nine percent of the respondents were Chinese (n=47), seven percent were Malays (n=4) and four percent were Indians (n=2). Majority of the respondents (49\%) have no formal education, whereas 34\% had primary education, married (85\%) and housewives (40\%).

Table 1. Body Mass Index status among respondents

<table>
<thead>
<tr>
<th>BMI Status</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Normal</td>
<td>18</td>
<td>34.0</td>
</tr>
<tr>
<td>Overweight</td>
<td>18</td>
<td>34.0</td>
</tr>
<tr>
<td>Obese</td>
<td>16</td>
<td>30.0</td>
</tr>
<tr>
<td>TOTAL</td>
<td>53</td>
<td>100.0</td>
</tr>
</tbody>
</table>

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Overall, with BMI measurement, the percentage of having at least overweight was 64%, in which 30% of the respondents were obese. Only two percent were underweight (Table 1).

Meanwhile, Table 2 shows the prevalence of overweight were higher among elderly, who more than 70-years old (38.9%) compare to obese which was higher among respondents who were 60-64 years age group (43.8%).

Female showed higher prevalence in overweight (61.1%) compared to male, who were more obese (56.3%). Malay and Chinese respondents showed higher prevalence in obesity (12.5% and 87.5%, respectively).

Majority of respondents with no formal education were obese (50%), whereas 44.4% of respondent who have primary education were overweight. Among married respondents, majority were overweight (53.3%).

### Table 2. Prevalence of overweight and obesity by socio-demography

<table>
<thead>
<tr>
<th>Status</th>
<th>Overweight (n=18)</th>
<th>Obesity (n=16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>6</td>
<td>33.3</td>
</tr>
<tr>
<td>65-69</td>
<td>5</td>
<td>27.8</td>
</tr>
<tr>
<td>&gt;69</td>
<td>7</td>
<td>38.9</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>38.9</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>61.1</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>2</td>
<td>11.1</td>
</tr>
</tbody>
</table>
Majority of the overweight respondents were diabetic (61.1%) and only 38.9% have hypertension. Whereas among the obese elderly 72.2% were having hypertension (Table 3).

Table 3. Status of Diabetes mellitus and Hypertension among respondents who were overweight and obese

<table>
<thead>
<tr>
<th>BMI status</th>
<th>Diabetes mellitus status</th>
<th>Hypertension status</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes (n (%)</td>
<td>No (n (%))</td>
<td>Yes (n (%))</td>
</tr>
<tr>
<td>Overweight</td>
<td>11 (61.1)</td>
<td>7 (38.9)</td>
<td>7 (38.9)</td>
</tr>
<tr>
<td>Obese</td>
<td>14 (31.3)</td>
<td>2 (68.7)</td>
<td>13 (72.2)</td>
</tr>
</tbody>
</table>

P value

*Fisher exact test
Table 4. Association between weight status and self-conscious among overweight and obese respondents

<table>
<thead>
<tr>
<th>BMI status</th>
<th>Self-conscious status</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n (%)</td>
<td>No n (%)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>3 (16.7)</td>
<td>15 (83.3)</td>
<td>18 (100)</td>
</tr>
<tr>
<td>Obese</td>
<td>6 (37.5)</td>
<td>10 (62.5)</td>
<td>16 (100)</td>
</tr>
</tbody>
</table>

*Fisher exact test

Among elderly respondents with overweight and obese, 83.3% and 62.5% respectively, were not conscious about their own body weight status. Fisher's exact test showed there was a significant association between weight status and self-conscious (p < 0.05) (Table 4).

Table 5. Attempt to lose weight among those who were self-conscious

<table>
<thead>
<tr>
<th>BMI status</th>
<th>Attempt to lose weight</th>
<th>Total</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n (%)</td>
<td>No n (%)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>2 (66.7)</td>
<td>1 (33.3)</td>
<td>3 (100)</td>
</tr>
<tr>
<td>Obese</td>
<td>3 (50.0)</td>
<td>3 (50.0)</td>
<td>6 (100)</td>
</tr>
</tbody>
</table>

*Fisher exact test

Majority (66.7%) of overweight respondents, who were self-conscious on their weight status, have tried to lose weight, compared to those who were obese (Table 5). However, there was no statistically significant (p > 0.05) in association between weight status and attempt to lose weight among those who were conscious on their overweight status.

IV. DISCUSSION

In 2010, overweight and obesity already were estimated to cause 3.4 million deaths, 3.9% of years of life lost and 3.8% of disability adjusted life years (DALYs) globally. The prevalence of overweight and obesity increases with age and ranges from 15% to 20% in
Overweight (including obesity) rates have almost stabilised in Italy, England and the United States, and have grown modestly in Canada, Korea and Spain, in the past ten years. Overall, 39% and 13% of Canadian older adults were classified as overweight and obese, respectively, whereas in Korea, the prevalence trend in overweight/obesity increased in men from 1965 to 2013 for men and from 29.8% (29.3-30.2) to 38.0% (37.5-38.5) for women. Increases were observed in developed and developing countries, but with different sex patterns. In developed countries, men have higher rates of overweight and obesity, while in developing countries, women exhibit higher rates and this relationship persists over time. This is consistent with a study done in a community-based national study, which reports that 43% of men and 77% of women aged 55–65 were obese. However, our result showed higher level of overweight and obesity among older persons aged 70 or older, similar with study done by Ustu and consistent with our finding in obesity. The lower prevalence among older persons aged 70 or more might be due to loss of appetite, lost interest in excessive eating, increased morbidities, and accompanied wasting. Physiological anorexia of aging is a normal consequence of food intake changes with increasing aging. Globally, the proportion of adults with a BMI of 25 or greater increased from 28.8% (28.4-29.3) in 1980 to 36.9% (36.3-37.4) in 2013 for men and from 29.8% (29.3-30.2) to 38.0% (37.5-38.5) for women. Increases were observed in developed and developing countries, but with different sex patterns. In developed countries, men have higher rates of overweight and obesity, while in developing countries, women exhibit higher rates and this relationship persists over time. This is consistent with a study done in a community-based national study, which reports that 43% of men and 77% of women aged 55–65 were obese. However, our result showed higher level of overweight and obesity among female respondents. This result was a combination of the prevalence of overweight and obesity in some Arab and European countries. For example in Egypt the prevalence among women and men was about 75% and 60%, respectively; in Jordan was 66% and 62%, respectively; and in Syria was 64% and 59%, respectively. However, the prevalence of overweight and obesity among women European countries is less than men. WHO reports lower overweight/obesity prevalence among women than men in United Kingdom (61% vs. 68%, respectively), France (45% vs. 57% respectively), Denmark (46% vs. 58%, respectively) and Canada (59% vs. 68%, respectively). Several factors are likely to contribute to the higher overweight/obesity level among women than men. The most common community health problem is lack of physical activity, especially among females where 71.3% females and 58% males are insufficiently active. The annual report of the KNSS also reports that about 75% of adult females did not engage in any physical activity compared with 60% of adult males.

In our study, overweight and obesity were noticed more among the married couples. This might be due to positive reinforcement among them to eat together and might relate to the effects of body weight on interpersonal attractiveness. Married elderly Kuwaitis living with spouse and/or children are likely to be surrounded by social support and warm family atmosphere that may enhance increased caloric intake facilitated by elongated duration of everyday meals, and at social gatherings. The lower education respondents had higher prevalence of both overweight and obesity. Being literate gives individuals to value life and live healthy in accordance; diet restriction, keeping fit physically and routine health screenings. Absence or minimal exposure to education deprives these individuals from good habits which in turn encourage unhealthy eating, sedentary lifestyles and to suffer from chronic illness. Similar study also supported our finding that obesity was seen in the lower education society and lower education contributed higher risk of obesity, suggesting lower level awareness on the risks and consequences of obesity.

Many of the health problems related to overweight and obesity among older persons are the same as among younger age groups. Obesity plays a role in predisposing the patients to diabetes mellitus or hypertension. High body mass index (BMI) can be a predictor of someone getting these diseases. The prevalence of diabetes increased with increasing age (3.2%, 11.5%, and 20.4% among persons who were 20 to 39, 40 to 59, and ≥60 years of age, respectively) and with increasing weight (7.6%, 12.8%, and 18.5% among persons with a body-mass index of 18.5 to 24.9, 25.0 to 29.9, and ≥30.0, respectively). Kirkman reports the prevalence of diabetes among U.S. adults aged ≥65 years varies from 22 to 33%, and diabetes mellitus is associated with hypertension (2.7 [1.6-4.5]; p <0.01). Those aged ≥75 years have higher rates than those aged 65–74 years for most complications. Deaths from hyperglycemic crises also are significantly higher in older adults. The prevalence of hypertension among the elderly in Malaysia has been reported as high as 58.3% and 54.5% in the community, and ranging from 36.0 to 50.3% in old folks homes. WHO previously reports multiple logistic regression analyses identified a higher body mass index and diabetes mellitus correlates with the hypertension and a study done by Yap finds that hypertensive patients usually have co-morbid with diabetes mellitus. This is consistent with our finding where there were statistically significant between higher body mass index with diabetes mellitus and hypertension (p < 0.05). These data emphasize the urgent need for a comprehensive integrated population-based intervention program to ameliorate the growing problem of diabetes mellitus and hypertension. The importance of controlling body weight should be highlighted as controlling body weight...
weight, decreasing the degree of weight gain, and delaying the beginning age of weight gain contributes to lower risk of suffering from hypertension and were effective measures in prevention and cure of hypertension and diabetes mellitus.47

The self-concept is the awareness one has of oneself48 and it is a collection of hundreds of self-perceptions, which among those perceptions is regarding body image or toward one's own physical appearance.49, 50 Many of respondents who are self-conscious about their appearance, are dissatisfied with their bodies.51 This body dissatisfaction increases during adolescence and continues into adulthood.52 The finding is consistent with our result where majority of the respondents who have higher body mass index were not self-conscious toward their weight status and this was statistically significance. Similar as our finding, Befort53 reports many obese respondents are interested in weight loss and have experienced in weight loss attempts. However, their interest in weight loss was largely driven by a desire to improve their health. Although appearance concerns are not as important as health concerns for motivating weight loss, negative body image may still play a role in weight control behaviors.

V. CONCLUSION

The prevalence of overweight and obesity were higher among elderly and there is a potential of higher prevalence of diabetic and hypertensive among obese elderly. Although there was no association between overweight status and self-conscious but the higher prevalence among them who were not conscious on their body weight problem were very worrisome.

As adults age, it is important to ensure that they not only live longer, but that their lives are fulfilling and lived in dignity with as much independence as possible. While good nutrition and regular exercise can influence a person’s weight, the focus cannot be on changing individual behaviours alone. Reversing the long term upward trends in overweight and obesity, especially among elderly, will require concerted and sustained action across all sectors of the community through multi-strategy interventions. Also, further studies are needed to collect more data and develop guidelines for preventing and managing overweight and obesity among elderly.

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Insilico Docking of Various Inhibitors of *E. Faecalis* Folate Pathway

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Abstract- Drug resistance to therapeutic antibiotics pose a challenge to the identification of novel targets and drugs for the treatment of infectious diseases. Infections caused by *Enterococcus faecalis* are a major health problem. Moreover, among UTI causing enterococci, multi-drug resistant *E. faecalis* such as vancomycin-resistant strains (VRE) have been reported increasingly in many countries. SMX & TMP are the commonly prescribed inhibitors of DHFR & DHPS, the enzymes of the folate biosynthetic pathway. In this study, insilico docking of various ligands/inhibitors to the *Enterococcus faecalis* DHFR & DHPS proteins has been performed by using Autodock Suite, version 1.5 6rC2.

Index Terms- Dihydrofolate reductase (DHFR), Dihydropteroate synthase (DHPS), Docking, Folate Pathway Inhibitors.

I. INTRODUCTION

Most clinical isolates from urine samples of UTI patients show presence of *Enterococcus faecalis* and account for 80–90% of clinical strains. *E. faecium* accounts for the remaining 5–10% of such isolates (4). Enterococci currently ranks fourth in frequency among bacteria isolated from hospitalized patients (4). They are nosocomial pathogens and are associated with high mortality. The treatment of these infections pose a great challenge, due to the inherent resistance of Enterococci to many antibiotics (1). In addition, they have the capacity to easily acquire and express new resistance genes and can thus tolerate antibiotic selective pressure (2).

Enterococci are Gram-positive ubiquitous bacteria that are widely found in all types of animals and in the environment. They are typically harmless inhabitants of various body sites—particularly the intestinal tract. However, enterococci are opportunistic pathogens (3). In addition, enterococci are inherently resistant to many antimicrobials, including penicillin, clindamycin, trimethoprim–sulfamethoxazole, and low levels of aminoglycosides, and they are poorly responsive to cephalosporins and fluoroquinolones in vivo (3).

They were traditionally regarded as low grade pathogens but have emerged as second leading cause of nosocomial infections and third most common cause of bacteremia. The most frequent infections caused by enterococci are UTI, endocarditis, bacteremia, intra-abdominal and intra-pelvic abscesses (5,6). This is amplified due to their acquired resistance to all currently available antibiotics that leaves the clinicians with limited treatment options and results in the selection and spreading of multidrug-resistant (MDR) strains in hospitals (7).

Trimethoprim (TMP) and sulfamethoxazole (SMX) are inhibitors of bacterial enzymes involved in the folate synthesis pathway. Folic acid is necessary to carry out a variety of important cellular functions, including synthesis of nucleic acids, particularly thymidine. Most bacteria are unable to take up exogenous folate from the environment and instead must synthesize it from the p-amino benzoic acid precursor (Refer Fig:1). TMP and SMX inhibit successive enzymes in this pathway, limiting the production of dihydrofolate and its subsequent conversion to tetrahydrofolate (8).

Use of computational methods is a cost effective strategy for speeding up the process of drug discovery and development process. Hence, understanding binding interactions between receptor and ligand is very essential for drug discovery scientists (9).

Molecular docking, a computational method of studying binding interactions in terms of binding energies is immensely used in the process of drug discovery to save on cost and time. In this method, computer generated representation of a small molecule or ligand is placed into the active site of the target or protein’s computational structure in a variety of positions, conformations and orientations. The position, orientation and conformation of the ligand in the active site of protein is called as a ‘pose’. In order to identify the energetically most favorable pose, each pose of the ligand is evaluated for binding energy computationally. The main objective of molecular docking method is to find a pose which has the lowest binding energy (9).

AutoDock abbreviated as AD, is an automated suite of protein-ligand docking tools. It is designed to predict the protein interactions with small molecules such as drug molecule and substrate. The application of this tool is immense, ranging from structure based drug design, lead molecule optimisation, protein-ligand docking, protein-protein docking, analysis and validation of mechanism of action of drug molecules, etc., AutoDock has two versions, namely, AutoDock4 and AutoDock Vina. The prior has been used in this study, AutoDock4 analyzes the interactions of ligand molecules at the specified target site of the protein. The users can define this specific target sites with the use of GridBox. AutoDock4 has two executable key programs, i.e., Autogrid4 and AutoDock4. Autogrid4 prepares a grid map of the amino acids presents within the GridBox defined by the user. AutoDock4

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then analyzes the interactions of those amino acids with the ligand molecule (10).

II. MATERIALS & METHODS

In silico studies

In silico studies utilizing molecular docking is an important tool to study the interaction of ligands with active site residues of the receptor (11, 12). The docking involves the use of sampling algorithm and a scoring function to evaluate the proper orientation and pose of ligand molecule in relation to the binding energy. The correct identification of this binding pose of one or more related ligands is important in establishing a structure-activity relationship in lead optimization. The second use of scoring functions is to rank different ligands to predict their relative experimental activity (12-14).

In silico studies were performed using Autodock 4 suite (version 1.5 6rC2). The ligands viz., Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid, Quercetin and Standard antibiotics viz., Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim were docked with DHFR & DHPS enzymes of *E. faecalis*. The ligands and the Standard antibiotics were selected on the basis of reported antibacterial activity and prescribed drugs.

The DHFR (PDB Id 4M7U) protein structure of *E. faecalis* was downloaded from PDB (X ray diffraction of 2.1Å). The crystal structure of DHPS *E. faecalis* is unavailable in PDB hence, to obtain structural information of DHPS, the homology model was generated using Swiss model and PdbSum. DHPS *E. faecalis* protein was found to have 40.86% sequence identities with PDB ID: W767. This structure was used for the preparation of the model of DHPS of *E. faecalis*. The prepared model was further validated by Ramachandran plot with the help of PROCHECK. This plot verified the DHPS protein (W767) and hence was used for docking studies Fig (2). These models were further used to analyse and compare the effect of binding efficiency of DHPS towards commonly prescribed antibiotics as well as various inhibitors (15). Next, the PubSum database yielded the ligands with their Ligplots. Ligplots give interacting sites of the DHFR Fig (5) & DHPS Fig (4). Fig (5A & B) depicts the Ramachandran Plots of DHFR and DHPS *E. faecalis* respectively. The structure of ligands were downloaded from Pubchem (chemical structure data base) online portal and drawn in Marvin Sketch version 5.8.1.Fig (6, 7). After docking, the results were analyzed on the basis of their binding energy and their interactions (15).
Fig(2): PDB STRUCTURE OF DHFR AND DHPS PROTEIN OF E. FAECALIS.

Fig(3): Ligplot of DHFR E. faecalis Ligand: Ligand Nap201(A) – (Ser65, Thr64, Arg44, Glu105, Val101, Ser100, Thr46, Gly99) interaction are shown by green dashed line.
Fig (4): Ligplot of DHPS *E. faecalis* Ligand: Ligand HH2 1(_) – (Ser54, His244, Arg242, Lys207, Asp171, Asn108, Asn15, Ser20, Thr55, Phe21) interaction are shown by green dashed line.

Fig (5): The Ramachandran plot shows the phi-psi torsion angles for all residues in the structure. Glycine residues are separately identified by triangles as these are not restricted to the regions of the plot appropriate to the other sidechain types. The colouring/shading on the plot represents the different regions: the darkest areas (here shown in red) correspond to the "core" regions representing the most favourable combinations of phi-psi values.
Preparing Proteins and Ligands:
The ligands viz., Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin and Standard Antibiotics viz., Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim that have exhibited prominent antibacterial activity towards isolated multidrug-resistant bacteria and have been reported were selected for molecular docking analysis (15). The structures of DHFR & DHPS were opened in Biovia Discovery Studio 2016 version 16.1.0.15350. The structure of protein was cleared (i.e. the extra groups which includes water molecules, ligand groups were removed) by deleting the heteroatoms present in the protein (16). Only the protein and active site for docking is required, hence was saved in the PDB format. The structure of ligands were downloaded from Pubchem and drawn in Marvin Sketch view version 5.8.1 and cleaned in 2D and 3D. This cleared the 2 dimensional and 3 dimensional structure of the ligand. For
docking, the protein structure was obtained in PDB format and ligands in tripos-Mol format or PDB format (16).

**Grid formation by Autodock**

Grid points generate the coordinates or interaction points where the ligand is docked. The grid box was generated at 60x60x60 Å³ to cover all the active site residues, and allowed the flexible rotation of ligands. The GA (genetic algorithm) and number of generation were set to 10 and 27000 for DHFR and DHPS respectively. The Lamarckian genetic algorithm was followed for ligand confirmation. All the above parameters decide the different confirmation of ligand in which the ligand will be docked. Other parameters for example, free energy (after docking is complete we get the value of free energy), rotatable bonds (number of rotatable bonds varies according to the ligand structure), number of torsions (16) etc were used as default (16).

**RESULT:**

Docking studies revealed the interaction of the protein with the ligands, w.r.t binding energy, type of interaction and amino acids involved in interactions. Binding energy should be ideally negative. More negative the binding energy, better the binding affinity of ligand and protein (16). Table 1 & 2 give the binding energy of ligands with DHFR & DHPS proteins respectively with inhibitors viz., Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin and Standard Antibiotics viz., Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim.

**TABLE NO.I: BINDING ENERGY OF LIGANDS UPON DOCKING WITH DHFR PROTEIN OF E.FAECALIS.**

<table>
<thead>
<tr>
<th>LIGANDS</th>
<th>Binding Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorogenic acid</td>
<td>-6.68</td>
</tr>
<tr>
<td>Ellagic acid</td>
<td>-7.47</td>
</tr>
<tr>
<td>Gallic acid</td>
<td>-5.19</td>
</tr>
<tr>
<td>Hippuric acid</td>
<td>-6.03</td>
</tr>
<tr>
<td>Quercetin</td>
<td>-7.47</td>
</tr>
</tbody>
</table>

Inhibitors (Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin) and Standard antibiotics (Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim) were docked and the results obtained provide a comparative insight into the potency of inhibitors and standard antibiotics through analysis of their binding capacities. The binding energies of DHFR of *E.faecalis* with Penicillin, Cephalosporin, Ellagic acid & Quercetin show highest binding than other ligands. Table 1 clearly shows that the standard antibiotics viz., Penicillin and Cephalosporin are more effective than the inhibitors docked, but *E.faecalis* has emerged resistant to these antibiotics (15).

**TABLE NO.II: BINDING ENERGY OF LIGANDS UPON DOCKING WITH DHPS PROTEIN OF E.FAECALIS**

<table>
<thead>
<tr>
<th>LIGANDS</th>
<th>Binding Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorogenic acid</td>
<td>-7.93</td>
</tr>
<tr>
<td>Ellagic acid</td>
<td>-6.84</td>
</tr>
<tr>
<td>Gallic acid</td>
<td>-5.81</td>
</tr>
<tr>
<td>Hippuric acid</td>
<td>-6.66</td>
</tr>
<tr>
<td>Quercetin</td>
<td>-8.22</td>
</tr>
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</table>

Inhibitors (Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin) and standard antibiotics (Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim) were docked and the results obtained provide a comparative insight into the potency of Inhibitors (Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin) and Standard antibiotics (Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim) were docked and the results obtained provide a comparative insight into the potency of
<table>
<thead>
<tr>
<th>LIGANDS</th>
<th>DHFR E. faecalis</th>
<th>DHPs E. faecalis</th>
<th>Interacting Sites</th>
<th>Hydrogen Bond Length In Å°</th>
<th>Hydrogen Bond Name</th>
<th>Interacting Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorogenic</td>
<td>2.181 2.034 2.146 1.988</td>
<td>- Gly18 Arg44 Gly99</td>
<td>Thr46 Ser100</td>
<td>1.954 2.205 1.797 2.019</td>
<td>-</td>
<td>Ser54 Asp171 Asn15</td>
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<tr>
<td>Ellagic acid</td>
<td>1.969 1.921 1.646 1.993 2.187</td>
<td>- Arg44 Ser65 Val101 Val102</td>
<td>Ser65 Gly99</td>
<td>1.821</td>
<td>Phe21 Phe21 Asn15</td>
<td></td>
</tr>
<tr>
<td>Gallic acid</td>
<td>2.163 1.721 1.934</td>
<td>- Arg44 Gly99</td>
<td>Thr46 Ser100</td>
<td>1.941 1.897</td>
<td>-</td>
<td>Thr55 Thr55 Asn15 Phe21</td>
</tr>
<tr>
<td>Hippuric acid</td>
<td>1.997 1.967 1.824</td>
<td>Ala45 Thr46 Gly99</td>
<td>Thr46 Ser100</td>
<td>1.736 1.849</td>
<td>Phe21 Thr55 Phe21</td>
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</tr>
<tr>
<td>Quercetin</td>
<td>1.937 2.024 2.079 1.787</td>
<td>- Ala45 Ser100 Val101</td>
<td>Thr64 Glu105 Ser100</td>
<td>2.238 1.9</td>
<td>-</td>
<td>Thr55 Thr55 Asn15 Ser20</td>
</tr>
<tr>
<td>Clavulanic acid</td>
<td>2.168 2.185</td>
<td>Arg44 Ala45 Gly99</td>
<td>Ser65 Glu105 Gly99</td>
<td>2.133 2.171 2.011 2.053</td>
<td>Asn15 Lys207 Arg242 Arg242</td>
<td>Thr55 Thr55 Phe21</td>
</tr>
<tr>
<td>Cephalosporin</td>
<td>1.961 2.069 2.109 2.172 2.147</td>
<td>- Arg44 Ala45 Val80 Gly99</td>
<td>Glu105 Thr64 Gly99 Thr46</td>
<td>2.028 2.102 1.993</td>
<td>Ph21 Thr55 Thr55</td>
<td>Arg208 Thr55</td>
</tr>
<tr>
<td>Cephalosporin C</td>
<td>1.957 2.138</td>
<td>Thr46 Ser65 Gly99</td>
<td>Ser100 Gly99</td>
<td>2.191 2.027</td>
<td>Thr55 Arg208 Thr55</td>
<td></td>
</tr>
<tr>
<td>Penicillin</td>
<td>2.194</td>
<td>Ser65</td>
<td>Thr64 Ser100 Gly99</td>
<td>2.194</td>
<td>Thr55 Thr55 Lys207</td>
<td></td>
</tr>
<tr>
<td>Sulfamethoxazole</td>
<td>2.133 2.024 2.071</td>
<td>Gly99 Ser100 Val102</td>
<td>Thr64 Gly99</td>
<td>2.204 1.861 2.034 2.249</td>
<td>-</td>
<td>Thr55 Lys207</td>
</tr>
<tr>
<td>Trimethoprim</td>
<td>2.063 2.062 2.014</td>
<td>- Val101</td>
<td>Glu105 Arg44</td>
<td>2.152 2.177 2.17 1.926</td>
<td>-</td>
<td>Thr55 Arg242 Arg242</td>
</tr>
</tbody>
</table>

**TABLE NO.III: INTERACTIONS OF LIGANDS WITH DHFR AND DHPs PROTEINS OF E. FAECALIS**
Fig (8): Interacting Sites of DHFR Protein of *E. faecalis* with Inhibitors i.e. (A) Chlorogenic acid, (B) Ellagic acid, (C) Gallic acid, (D) Hippuric acid and (E) Quercetin.
Fig(9): Interacting Sites of DHFR Protein of E. faecalis with Antibiotics i.e. (A) Clavulanic acid, (B) Cephalosporin, (C) Cephalosporin C, (D) Penicillin, (E) Sulfamethoxazole and (F) Trimethoprim.
Fig(10): Interacting Sites of DHPS Protein of *E. faecalis* with Inhibitors i.e. (A) Chlorogenic acid, (B) Ellagic acid, (C) Gallic acid, (D) Hippuric acid and (E) Quercetin.
III. DISCUSSION

UTIs are the most common infections caused by Enterococcus faecalis. Little is known about the bacterial factors necessary for E. faecalis to cause infections in general, and even less has been reported related to the urinary tract. Many researchers have exposed the emergence of multidrug resistance in Enterococci faecalis to all clinically useful antibiotics (15, 17).

Insilico studies with DHFR & DHPS showed a high binding affinity towards the ligands viz., Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin and as well as the prescribed standard antibiotics viz., Clavulanic acid, Cephalosporin, Cephalosporin C, Penicillin, Sulfamethoxazole and Trimethoprim.

Molecular docking has been carried out to check the efficiency of these ligands and Standard antibiotics to bind to the active site of the DHFR protein of the folate pathway. On comparing the various inhibitors and standard antibiotics docked...
upon DHFR and DHPS of *E. faecalis*, Quercetin, Ellagic acid, Penicillin and Cephalosporin show higher binding affinity. Hence, it can be concluded that the compounds Quercetin and Ellagic acid have significant potential to bind to the active site of DHFR.

Our study also shows that, inhibitors like Clavulanic acid and Gallic acid efficiently bind to the active site of the DHPS of *E. faecalis*. Quercetin and Chorogenic acid have the highest binding affinity to the ligand binding pocket of DHPS of *E. faecalis*. When compared to inhibitors i.e Quercetin and Chorogenic acid, antibiotics like Cephalosporin & Penicillin show higher interactions towards DHPS of *E. faecalis*.

Even though, Standard antibiotics viz., Cephalosporin and Penicillin do show strong interactions with both the proteins of the folate synthesis pathway, the clinical isolates of *E. faecalis* have developed resistance to these. Hence, a better alternative, which binds to DHFR is Quercetin and Ellagic acid while inhibitors that binds to DHPS are Quercetin and Chorogenic acid.

Protein binding with various ligands, indicate that various inhibitors viz., Chlorogenic acid, Ellagic acid, Gallic Acid, Hippuric acid and Quercetin of DHFR and DHPS can be utilized for the treatment of MDR-UTI after due *in vivo*, *in vitro* and ADMET testing, since they have been proved to posses potential antibacterial activities.

IV. CONCLUSION

Antibiotics have been a high success till date for curbing bacterial infections. But, the widespread and uncontrolled use of antibiotics has led to the emergence of multidrug-resistant (MDR) bacteria (15). Along with limited treatment options and increased mortality the MDR seems grave. Hence, there is an urgent need to search for a new antibacterial agent. The molecular docking programs aid to establish new ligands/inhibitors for the selected target receptor proteins from the different available databases, based on their efficiency to bind the active sites on the receptor (15). Our study shows that inhibitors viz., Quercetin and Ellagic acid show best interactions and binding energy with DHFR while Quercetin and Chorogenic acid show best interactions and binding energy with DHPS of the folate synthesis pathway of *E. faecalis*. These *in silico* studies supported with *in vivo*, *in vitro* and ADMET testing will certainly help towards developing candidates for treatment of MDR-UTI in the future. More studies on mutations are needed for corroborating the role of quercetin, chlorogenic acid and ellagic acid as antibacterial agents to treat MDR *E. faecalis* mediated uropathological infections.

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Parent-Child Interaction Therapy for ADHD and related disorders: An overview

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Abstract- Parent–Child Interaction Therapy (PCIT) is a psychosocial treatment for preschoolers with conduct, behavioral problems and their parents. PCIT is empirically validated intervention that is designed for families with young children and was draw from both attachment and social learning theory in which teaching parents to interact with their child in new ways to change the child’s behavior. The PCIT provides a comprehensive treatment approach that is focused on increasing positive behavior, decreasing negative behavior, and improving the parent-child relationship. In this overview an attempted has been made to desirable to Parent-Child Intervention Therapy and to provide an overview for research conducted after the introduction of the therapy. It is apparent significant research work had been carried out into behavior and conduct problems. Hence this systematic approach to the child and the parent in the management of behavior and emotional problems would be beneficial to the young research scholars in child clinical psychology and professionals.

Index Terms- Parent-Child interaction Therapy, Behavior Disorders, Parents of children with behavior problems

I. INTRODUCTION

Children with disruptive behaviour constitute the most frequent referrals for child mental health services (Kazdin, Mazurick, & Siegel, 1994) and experience a broad range of impairment that is generally more severe and chronic than that experienced by other clinic-referred children (Lambert, et al., 2001). Early disruptive behaviour persists across stages of development (Barkley, et al., 1991; Campbell, 1995; Moffitt, 1993) and is a powerful predictor of subsequent delinquency and criminal behaviour (Loeber, et al., 1995) as well as a host of personal and social difficulties in adulthood (Loeber, 1991; Robins, 1981). Research shows that 19% students were suffering from learning disability in the schools and these children exhibiting significant behavioral problems than normal children in the form of hyperactivity and aggression (Sridevi, et al., 2015). The major casual factor for emotional stress in adolescents are found to be poor family atmosphere and the child’s poor health condition may lead hysteria, neurasthenia, anxiety neurosis as well as obsession-compulsion in children with adolescents(Shailaja, Prachi & Sridevi, 2014). The prevalence and chronicity of disruptive behaviour underscores the need for treatments that are both effective for young children and durable. An intensive early intervention is critical in maximizing outcomes for children with behavior problems and evidence suggests that the earlier the intervention, the better the outcome. Research also found that an early intervention can improve adaptive and personal-social behaviors of children with autism (Sridevi & Saroj Arya, 2014). Brestan and Eyberg (1998) reviewed the psychosocial treatment literature for conduct problems and identified several treatment programs that have been empirically supported. Several of the identified programs were specifically intended for young children (Eyberg, Boggs, & Algina, 1995; Hamilton & Mac Quiddy, 1984; Peed, Roberts, & Forehand, 1977; Tremblay, et al., 1995; Webster-Stratton, 1984; Wiltz & Patterson, 1974). CBT intervention is widely studied and empirically validated treatments for anger and aggression in youth and the research was also concluded CBT was effective to reduce 60% in the existing symptoms of emotional and behavioral problem with an adopted adolescent girl (Tripathi & Sridevi, 2016). One of the empirically supported treatments for young children with disruptive behaviour disorders that have examined both immediate and long-term outcomes is parent–child interaction therapy (Brinkmeyer & Eyberg, 2003). Based on developmental theory (Baumrind, 1967), PCIT draws on both attachment and social learning theories in training parents to interact in new ways with their child. During PCIT, parents are observed as they play with their child and are coached in treatment skills that emphasize both responsiveness and limit-setting. The average number of weekly 1-hr sessions typically ranges from 9 to 16, with an average of 13 sessions (Schuhihnann, et al., 1998).

Studies have shown statistically and clinically significant improvements in children’s behaviour at the end of treatment on parent and teacher rating scales and direct observations in the clinic and at school. Specifically, these studies have documented the superiority of PCIT to wait-list control groups (McNeil, et al., 1999; Schuhmann et al., 1998), classroom comparison groups (McNeil, et al., 1991), and group parent training (Eyberg & Matarazzo, 1980). PCIT outcome studies have demonstrated positive changes in parents’ interactions with their child, including increased reflective listening, physical proximity, and pro-social verbalization, and decreased criticism and sarcasm at treatment completion (Eisenstadt, et al., 1993; Schuhmann et al., 1998). Studies also have shown significant changes on parents’ self-report measures of psychopathology, personal distress, and parenting locus of control (Eyberg et al., 1995; Eyberg & Robinson, 1982).

Maintenance of treatment gains following completion of PCIT has been examined in only a few studies to date. Short-term follow-up studies have shown maintenance on observational...
measures of parent praise, commands, and criticism and child compliance; parent ratings of child externalizing and internalizing problems and activity level; parent self-reports of stress, competence, and control; and child self-reports of self-esteem (Eisenstadt et al., 1993; Nixon, et al, 2003; Querido & Eyberg, 2003). Longer term (1 to 2 year) follow-up studies have demonstrated maintenance of gains in observed parenting skills and child deviant and noncompliant behaviours with their parents, and parent reports of child activity level and conduct problems, as well as the absence of disruptive behaviour diagnoses for most of the children (Eyberg et al., 2001). Longer term maintenance of children’s changes in school behaviours have also been found on classroom observational measures of compliance and teacher ratings of disruptive behaviour (Funderburk, et al., 1998). Recently, the first controlled follow-up study of PCIT compared 23 families who had completed treatment with 23 families who had not (Boggs, et al., 2003). In this study, parents reported significantly less frequent disruptive behaviour at 1 to 3 year follow-up for children who completed treatment, and large effect sizes were obtained in the treatment-completer group.

Parent-child interaction therapy (PCIT)

Parent–child interaction therapy (PCIT) is a psychosocial treatment for preschoolers with conduct, behavioral problems and their parents. Parent–Child Interaction Therapy (PCIT) was originally developed in the 1970s by Sheila Eyberg for families of children ages 2 to 7 diagnosed with disruptive behavior disorders. PCIT is an evidence-based behavioral parent training program and it is working with parents and their young children. In this program the therapist coaches the parent during real-time interactions with the child. The distinguishing feature of PCIT is that it focuses on improving the quality of the parent–child relationship by coaching parents in specific skills as they interact with their child. PCIT is empirically validated intervention that is designed for families with young children and was drawn from both attachment and social learning theory in which teaching parents to interact with their child in new ways to change the child’s behavior. Early intervention is critical to prevent negative developmental course and outcomes. The PCIT emphasizes a comprehensive treatment approach that is focused on increasing positive behavior, decreasing negative behavior, and improving the parent-child relationship (McDiarmid & Bagner, 2005). It enables the families to interact with their children and achieve satisfying relationships and positive outcomes for children and their families for years to come (Epps & Jackson, 2000). The major goal of the PCIT is to improve the quality of parent-child relationship, increasing parent skills, improve the child’s pro social behavior, and reduce the child behavior problem and parental stress.

The treatment sessions begin as soon as the initial assessment is completed. The PCIT is typically conducted in 1-hour weekly sessions and is usually completed within 9 to 16 weeks. The PCIT consists two phases such as Child-Directed Interaction (CDI) and Parent-Directed Interaction (PDI). Goals of the first phase, the Child-Directed Interaction (CDI), are to improve the quality of the parent-child relationship and strengthen attention and reinforcement for positive child behavior. The CDI includes enhancing the child's self-esteem, promoting pro-social behavior in the child, and reducing the child's anger and frustration. In the CDI, parents learn to follow their child’s lead in dyadic play and provide positive attention combined with active ignoring of minor misbehavior. They are taught to use the PRIDE skills such as praise, reflection, imitation, description, and enthusiasm to reinforce positive and appropriate behaviors. Parents also learn to avoid leading or intrusive behaviors such as commands, questioning, criticism, sarcasm, and negative physical behaviors. This phase forms the foundation for effective discipline training and in the second phase, the Parent-Directed Interaction (PDI). In the PDI, parents learn to lead their child’s activity, first in dyadic play situations and later in real-life situations when it is important that their child obey. The authors of the PCIT report that parents are coached in the use of behavior management techniques that promote child compliance and reduce aggressive and disruptive behaviors. They learn to give effective instructions and to follow through with consistent consequences, including praise for compliance and a timeout procedure for noncompliance.

At the University of Oklahoma Child Study Center, researchers conducted the first randomized controlled trial of PCIT with physically abusive families. Results demonstrated significantly reduced recidivism during 21 /2 years after treatment compared with standard community parenting group intervention (Chaffin et al., 2004). PCIT has been designated an evidence-based practice in addressing child abuse (Chadwick Center, 2004). The originsations of the therapy specified that parent child Interaction Therapy process has 7 steps with 9-16 weekly sessions.

The process of Parent-Child interaction therapy:

Step-1: Pre treatment assessment of child and family functioning (1-2 sessions)

Initially, in the first session pre treatment assessment of child and family functioning are carried out. In this session, the information is gathered on history and presenting problems Questionnaires are given, and the therapist observes (and may videotape) a sample of how the parents and child relate to one another. The interactions between parent and child; child behaviors, parental perception of stress related to being a parent, and as well as parents’ own perceptions of the difficulty of their child’s behaviors are assessed in these sessions. Feedback regarding assessment results and treatment planning is provided to families either at the end of the pre-treatment assessment session or in a separate “therapy orientation session.” Assessment tools used are Child Behavior Checklist – Parent Form, Eyberg Child Behavior Inventory, Parenting Stress Index, Social Skills Rating System, Conner’s Parent Rating Scale – Revised, Vineland Adaptive Behavior Scales, Childhood Autism Rating Scale, Minnesota Multiphasic Personality Inventory –2 and Beck Depression Inventory.

Step-2: Teaching Child-Directed Interaction skills (1 session)

The step-2 contains Child Directed Interaction teaching session which is conducted in one session. In this session the therapist meets only with the parents and teaches them the Child Directed Interaction basics by using didactic presentation, discussion, live modeling, and role-playing. The parents are the active participants for these sessions.
The process of Child Directed Interaction is to describe the goal of behavior play therapy and explain the rationale for the use of brief daily home “play therapy”. The goal of the behavior play therapy is based on presenting concern or problem and it is important to convey that playtime is a therapeutic intervention and not “just playing” with the child. Play therapy should not be viewed as a privilege that the child can earn or lose and it should be done for at least 5 minutes every day with the child. In this session, illustrate “Do” and “Don’t” skills of behavioral play therapy and use of strategic attention and selective ignoring are discussed. The “Do” skills (DRIP) explains as Describe appropriate behaviour, Reflect appropriate verbalizations, Imitate appropriate play, Praise pro-social behavior. The “Don’t” Skills are giving commands or making requests, asking questions, criticizing or correcting in a negative way. The usage of selective ignoring explains that parents have to identify behaviors or qualities which they would like to see diminished and in order for ignoring to be effective, the child must be doing the problem behavior to get a reaction or attention from the parent. In this session therapist helps the parents to analyze whether their attention rewards the child for engaging in each of the behaviors and whether the removal of attention should be expected to impact the behavior. Parents must also understand that once they begin to ignore a behavior they must continue to ignore the behavior until it stops occurring. It is important for parents to understand that a behavior that is ignored will get worse before it gets better and parents should determine if they can tolerate having the behavior get worse before it gets better.

Step-3: Coaching Child-Directed Interaction skills (CDI) (2–4 sessions)

The Child Directed Interaction coaching sessions begins with a 5- minute observation of the interaction, coded by the therapist, which indicates the primary focus of the session. During coaching, the therapist prompts and reinforces the parent’s use of the pride skills and points out their positive effects on the child’s behavior. The therapist has to encourage and shape reciprocal interactions and responsive parenting.

Step-4 & 5: Teaching and coaching Parent-Directed Interaction skills (PDI) (1 session and 4-6 sessions)

During Parent Directed Interaction (PDI), parents continue to use their Child Directed Interaction (CDI) skills, but they also learn to direct their child’s behavior by using effective commands and specific consequences for compliance and noncompliance. This PDI teaching session consists of didactic information, discussion, role-playing, and time out procedure with each parent and following on these sessions.

Parents are taught effective commands, and the command should be direct rather than indirect. For Example: “Please hand me the block” instead of “Will you hand the block?”. The precise steps that must be followed after a running command to perform a specific commands is given to the child like, “Good job of putting the toys away” and “I like the way you’re playing so gently with the toys”.

Parents are taught to give a labeled praise if the child obeys or to initiate the time-out procedure if the child disobeys. The parents are again observed together with the child for several sessions of direct skills coaching. These sessions begin in the clinic setting and could be extended to community settings. Treatment is concluded with a “graduation session” when all of the presenting problems have been resolved or substantially improved. Upon graduation, parents receive a certificate and children receive a prize (e.g., blue ribbon) to acknowledge their successes, and the parents are asked to review handouts summarizing PDI techniques prior to the next session.

Step 6: A post-treatment of child and family functioning (1–2 sessions)

Post treatment evaluation sessions will be administered before therapies are repeated. End of this session, feedback is provided to the family in which pre- to post-treatment improvements are reviewed. This session helps parents to solidify their recognition of improvements that have been occurring gradually over several weeks of treatment. For most families, the full course of treatment can be conducted in approximately twelve sessions.

Step 7: Boosters (as needed)

A booster session is usually scheduled at 3 months but it could be occurred earlier if needed. Additional booster sessions may be scheduled to enhance maintenance of parenting skills and address problems that arise as children face new developmental challenges.

Parent-Child Interaction therapy and its effects on ADHD

The Child Directed Intervention with ADHD children is to provide feedback to parents regarding test results and educating the parents about ADHD and its treatment program and progress in the initial session. During CDI coaching, the therapist prompts and reinforces the parent’s use of the pride skills and points out their positive effects on the child’s behavior. The therapist has to encourage and shape reciprocal interactions and responsive parenting. CDI help parents to understand the importance of behavioral descriptions in helping children with ADHD to sustain attention. The major behavioral descriptions key functions with ADHD children are stimulation for “on-task behavior” in which the task becomes more stimulating to the child. It helps children to organize their thoughts and make them to stick with one activity for longer periods of time and to feel proud of their accomplishments. When parents describe behavior in a step-by-step fashion, they are helping their children to think in a step-by-step, linear way. The other behavioral description is that they prompt children to develop self-talk. CDI in which the parent provides a “running commentary” of almost everything the child is doing, the child begins to imitate descriptive language. First, the child may talk out loud when playing alone, describing the child’s own play (e.g., “I’m putting the man in the tractor; He’s going to feed the animals”). These descriptions become internalized and the child can silently talk the way through tasks and this self-talk increases the attention span of children with ADHD. A benefit of restricting CDI to the tabletop is that, it provides numerous opportunities to practice ignoring and redirecting inappropriate behavior, skills that are vitally important when parenting children with ADHD. Parents could train to ignore when children leave the table, describe their own play enthusiastically and provide attention and praise when the child returns to the table. Another benefit of using a table for...
CDI is that it enables children to remain seated, an important skill for classroom success.

The Parent Directed Intervention with ADHD Children coaches to keep parents from giving rapid-fire commands without allowing their children the opportunity to comply. Parents are “bite their tongues” after giving a command in order to give their children five seconds to understand the command and initiate a response. Therapist will train the parents to wait for the child’s response for each command which they give and to praise the child when they complete the task. ADHD children often hurt and beat their siblings and friends by accidentally. Parents have to train to use time out technique when the child shows aggressive behavior or hurt the siblings inappropriately (e.g., Kung Fu kicking, sword fighting with sticks) to provide the children with an opportunity to calm down and to encourage them to use better judgment in the future. In contrast, it is not recommend to use a time-out technique for incidental hurting that occurs during appropriate play (e.g., stepping on another child’s toe). In those situations, the children are encouraged to express appropriate remorse and to comfort the injured party. The end of PDI, focus is on coaching situations that are more challenging for children with ADHD such as academic tasks.

CDI draws from attachment theory in its aims to restructure the parent-child relationship and provide a secure attachment for the child. Parents are taught skills that foster positive, nurturing interaction patterns. This phase of treatment recognizes that parents can have a particularly dramatic effect on their child's behavior during the early preschool years when children are more responsive to parental attention and less susceptible to the influence of peers, teachers, or developmental autonomy than in later years (Eyberg, Schuhmann, & Rey, 1998).

Eisenstadt, et al., (1993) conducted a research on the effectiveness of Parent-Child Interaction Therapy (PCIT) for 24 mother-child dyads with children with behavior problems children. Families received 14 weekly sessions of PCIT, with half receiving Child-Directed Interaction training first (CDI-First group) and half receiving Parent-Directed Interaction training first (PDI-First group). At mid treatment, the PDI training stage was more effective than the CDI stage for reducing noncompliance and disruptiveness. It also found that the PDI-First group was better improved on parent report of conduct problems, and mothers were also satisfied with therapy.

Research indicates that externalizing behavior originates from multiple child and family factors. Child factors may include difficult temperament (Bates, et al., 1991), hyperactivity (Loeb & Keenan, 1994), faulty social information processing (Crick & Dodge, 1994), and genetic difficulties. These child factors interact with adverse family factors in the development and maintenance of externalizing behavior (Kazdin, 1987). Family factors may include maternal depression (Forehand, Furey, & McMahon, 1984; Webster-Stratton & Hammond, 1990), stressful life events (Campbell, 1998), anger (Wolfe, 1987), and parent conflict about childrearing (Bearss & Eyberg, 1998; Bearss, Eyberg, & Hoza, 2002), social isolation (Dumas & Wahler, 1983), single-parent status, or poverty (Forehand et al., 1984). Parents’ early interactions with their young child appear to be the most proximal parental influence on the child's behavioral development (Campbell, 1997), and parenting practices continue to play a critical role in the maintenance of externalizing behavior throughout childhood and adolescence (McMahon & Estes, 1997).

Parent-Child Interaction Therapy (PCIT) is a short-term, evidence-based intervention designed for families with children between the ages of 2 and 6 who are experiencing a broad range of behavioral, emotional, and family problems. PCIT is an empirically supported treatment for conduct-disordered young children in which parents learn the skills of child-directed interaction (CDI) in the first phase of treatment and parent-directed interaction (PDI) in the second. A study by Schuhmann et al., (1998) examined the effectiveness of parent-child interaction therapy (PCIT) with families of preschool-age children with oppositional defiant disorder. Results indicated that parents in the immediate treatment condition interacted more positively with their child and were more successful in gaining their child's compliance than parents in the wait-list condition. In addition, parents who received treatment reported decreased parenting stress and a more internal locus of control. Parents in the immediate treatment group reported statistically and clinically significant improvements in their child's behavior following PCIT. All families who received treatment reported high levels of satisfaction with both the content and process of PCIT. Preliminary 4-month follow-up data showed that parents maintained gains on all self-report measures (Schuhmann, et al., 1998). Parent-Child Interaction Therapy has long-term benefits for families with young children displaying early conduct problems (Nixon, et al., 2003). A similar study examined the long-term treatment outcome for 13 families who had participated in a treatment study examining the effects of treatment phase sequence one and two years earlier and results suggested that PCIT treatment was successful in achieving long-term gains for most families of conduct-disordered preschoolers and that phase sequence has little impact on treatment outcome (Eyberg et al., 2001).

PCIT originally was developed and evaluated for the treatment of disruptive behavior disorders in young children. PCIT is a promising intervention for externalizing problems in children (Foote, Eyberg & Schuhmann, 1998), focusing on improving child-parent relationships and providing parents with skills to manage disruptive behavior. Parents of children exhibiting externalizing behaviors have often been found to be both power-assertive and lacking in their discipline. This inconsistency serves to strengthen the young child's externalizing behavioral repertoire (Sansbury & Wahler, 1992).

The initial efficacy of the Parent-Child Interaction Therapy (PCIT) for preschool children aged 4-6 years with ADHD, combined or predominantly hyperactive type, and significant behavior problems was conducted by Matos, et al., (2006). They reported that there was a highly significant reduction in pretreatment hyperactivity and inattention and less aggressive and oppositional-defiant behaviors. Conduct problems assessed as problematic, parenting stress associated with their child's behavior and an increase in the use of adequate parenting practices were reported.

Parent-Child Interaction Therapy (PCIT) was adopted for Purto Rican parents of children aged 4-6 with hyperactivity and other significant behavior problems and the authors reported that parents had a high level of satisfaction, a significant reduction in children’s externalizing behavior problems, and reduction of
parenting stress and improvement in their practices (Matos, et al., 2006).

The effectiveness of Parent-Child Interaction Therapy with behaviour problem children was conducted by Eisenstadt et al., (1993). They found that families moved from outside normal limits to within normal limits on compliance, conduct problems, activity level, and maternal stress, and showed improvement in internalizing problems and child’s self-esteem. There is evidence to suggest that families in which a mother is highly critical or depressed respond poorly to PCIT (Werba, et al., 2002). Further it was concluded that parents actively abusing a drug, or experiencing severe marital discord or psychopathology also may respond poorly to PCIT (Hembree-Kigin & McNeil, 1995).

A study examined the long-term maintenance (3-6yrs of after treatment) of changes following parent–child interaction therapy (PCIT) for young children with oppositional defiant disorder (ODD) and associated behaviour disorders. The mothers of 23 children between the ages of 6 and 12 participated in telephone and mail follow-up assessments. Child behaviour reported at the post-treatment assessment and length of time since treatment were strong predictors of long-term outcome and the results of this study support the long-term effectiveness of PCIT (Hood & Eyberg, 2003).

Michelle, et al., (2009) conducted a study on Early Identification and Intervention for Behavior Problems in Primary Care: A Comparison of Two Abbreviated Versions of Parent-Child Interaction Therapy. Results indicated that decreases in child problem behaviors and ineffective parenting strategies, and increase in parental feelings of control were not significantly different between versions at post-intervention or 6-month follow-up. The Changes during intervention were significantly larger for both groups than changes during pretreatment baseline. Daniel, et al., (2009) conducted a study on Parent-Child Interaction Therapy for Children Born Premature: A Case Study and Illustration of Vagal Tone as a Physiological Measure of Treatment Outcome. The study indicated that maternal reports of child behavior problems and their own stress and depressive symptoms decreased after treatment and the behavioral observations demonstrated improved parenting practices.

II. CONCLUSION

Parent–child interaction therapy (PCIT) is a psychosocial treatment for preschoolers with conduct, behavioral problems and their parents. PCIT is an evidence-based behavioral parent training program and it is proved to be effective with parents and their young children. It is a treatment program for preschool-age children with ADHD and conduct problems and their families. This treatment is theoretically based, assessment driven, and empirically supported. PCIT an effective program as evidenced by large body of research reports cited in this overview. PCIT decrease disruptive behavior and increase pro-social behavior of the child and improve the psychological functioning of the parents.

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Social Media Influence of Spiritual Discipline of Students
(Rating of Participants of Training 2016 Religious SMA Catholic Teachers)

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Abstract- The world grows so rapidly, as no stopping word rotation. This development is characterized by the rapid spread of information in the hemisphere. Social Media is an online media that users can easily participate, share and create contents include blogs, social networks, wikis, forums and virtual worlds.

When the Internet and mobile phone technology is more advanced, the social media grows rapidly. Now for accessing facebook or twiter for example, can be done anywhere and anytime just by using a mobile phone. Of course, the area or point of social media users are connected to the Internet through a wireless network or a (wireless LAN / WLAN) and Wi-Fi. The research objective is to analyze how big the influence of social media on the spiritual discipline of training learners.

Model of research is explanatory models that attempt to explain the position of the variables, studied and the effect of one variable to another variable. Collecting data use a questionnaire to the population of 35 High school Catholic religious teachers as sample who are attending the substantive technical training that increase their competence.

Based on the analysis, partially showed that party, social media affects 88.5%, against the spiritual discipline of learners 73.4%. From these results it looks very important role of social media. This requires attention to teacher education subjects Catholic religious Teacher, that the spiritual discipline of students was influenced by social media.

Index Terms- social media, spiritual disciplines

I. INTRODUCTION

Education has a very important effect for a nation. Without education, the nation will fall behind other nations. Education as an institution that is very competent to improve the quality of human resources as well as promote development. There are many people with low education (elementary, junior high school) and they move in agriculture, small industry of both traditional and modern, government, commerce, social services, and construction.

In the globalization era, Byadvancing technologies and communications, we feel the word in the hand. Advances in technology and sophisticated information that manufactured by industry presents world in your hands. Technology is never starmart, always moving forward looking for new ways to enable people. Previously internet can be enjoyed only in a certain place. Now the Internet can be enjoyed anywhere and while mobile. Innovations from hardwearlovers and providers make the world is utterly inconceivable that in the hand.

Social Media is an online media that users can easily participate, share and create contents include blogs, social networks, wikis, forums and virtual worlds. When the Internet and mobile phone technology more advanced. So social media is growing rapidly too. Now for accessing facebook or twiter for example it, can be done anywhere and anytime just by using a mobile phone, where the area or point of social media users connected to the internet via wireless or wired network. Children and young people as social media user still need supervision from adult in order to get positive impacts and advantages. Science and technology development facilitate them to communicate, search and access information, get and relationship network.

On the other hand, social media has negative impacts to the children and young people, as a social media addicted they become lazy because it is too busy with social media, they also forget his obligations as a student. In addition, they will also be selfish, not caring about the environment because of the time spent on the internet fun.

Spiritual disciplines interpreted as a way for followers of the Lord Jesus more and more mature to the Lord Jesus. Maturing spiritually alive is the main goal of every believer, including the Catholic teenagers. To practice the spiritual disciplines can be done in several forms, such as quiet time of prayer, reading God's word and prayer together. These forms of spiritual discipline should be applied and trained since childhood, in order to become a good habit and it can also lead your friends to not getting caught up in the negative things.

The problem in this research is: How big is the influence of social media on the spiritual discipline of learners.

Researchers interested in conducting research on the influence of social media on the spiritual disciplinary learners, because this point is the most potential in education effort, building the nation, to keep disciplined closer to the creator, can filter and use technology to improve the science. Likewise teachers to be more professional in their field, mastering the technology, coupled with strong faith, as well as leadership in educating, TutWuriHandayani.
II. RESEARCH METHODOLOGY AND DISCUSSION

A. Research Methods

The method used in this research is the analysis simple and multiple linear regression, with X as the independent variable (independent) and Y as the dependent variable analysis model research

Information:
X: Social Media
Y: spiritual discipline learners
R xy: the coefficient of the influence of social media on the spiritual discipline of learners

Population and at the same time as the sample in the study was the subject teachers of religious education being catholic high school education and training at the Training Center and the religious education of technical personnel, Ministry of Religious Affairs of the Republic of Indonesia.

B. Discussion

1. Social Media

In this era of globalization we are already familiar to social media. The development of social media surges so fast, because everyone has their own media, media such as television. Arequries A lot of funds and labor. Social media users can access the media to the internet without great expense and can be done alone.

Andreas Kaplan and Michael Haenlein (2010: 58) defines social media as a group of Internet-based applications that build on the ideological and technological, and which allows the creation and exchange of user-generated content'.

Wikipedia, social media is a computer-based tool that allows people to create, share or exchange information, ideas, and video images in virtual communities and networks.

At the time of internet and mobile phone technology is advancing, the social media also grow rapidly. Now to access facebook or twitter for example, can be done anywhere and anytime by simply using a mobile phone. So fast people can access social media resulted in a major phenomenon of the flow of information not only in those twitter developed countries, but also in twitter Indonesia.

Social media has characteristics, as follows:
• Messages are conveyed not only to one person but can control every aspect of a lot of people, for example through SMS messages, whatsapp, etc.
• Messages are conveyed freely, without having to go through a Gatekeeper.
• Messages conveyed tends to be faster compared to other media.
• Recipients of the message that determines the interaction time.

2. Spiritual Discipline

Discipline comes from the English discipline that is rooted from the word disciple which means that the student, follower, or a recipient of a teaching and spreading the teachings. Discipline comes from the word discipline means that the rules that must be followed. Discipline is obedient to the rule, with the awareness itself to the creation of a purpose.

Of the word discipline comes the word discipline. According W.J.S Poerwadarmima, discipline comes from the word discipline that got confixKe-an that has an inner meaning and nature of exercises with the intention that his actions always obey the order.

In other words, spiritual discipline is means of develop one's spirituality which have changed by Christ when he was saved, that through His grace frees a believer, who has undergone a renewal holistically, which is manifested through changes in thoughts, feelings, and character gradually may be revealed in real behavior.

In a knowledge of God contained a close relationship, a full surrender and trust. The more we know God the more we understand God's call, and increasingly aware of our existence before Him. "For I desire mercy, and not sacrifice, and love the knowledge of God, Leih than burnt offerings." (Hosea 6: 6).

Spiritual disciplines are activities of believers who do the sowing seeds in the Spirit (Gal.6: 8)

Various spiritual disciplines are known in the Bible is:
1. Discipline in learning
2. Discipline in communicating with God
3. Discipline has hunger and thirst for God
4. Discipline in solitude with God
5. Discipline in recording days with God
6. Discipline in serving God and others
7. Discipline in preaching the gospel
8. Discipline in domestic affairs and God's blessing

Through spiritual discipline that God can turn someone into a human work that is increasingly destructive and replace them with new habits of life. Christlike. Spiritual disciplines also help people change old habits that need to be renewed in their lives.

Spiritual discipline serves as a "spiritual practice", there are some basic forms of spiritual practice, among others testify, allied, quiet time, reading the Word of God.

From the data processing are obtained the following results:

1. Frequency analysis descriptively Result

Social media and diskritif spiritual discipline can be explained and understood all respondents, because the value range of 3,73-5,00.

2. Normality Test Results

The test results showed that the value of sig < alpha (5%) for all variables tested, the conclusions obtained is social media, and spiritual discipline have or meet the normal distribution of data.

3. Validity and Reliability Test Results

Validity test

The test results showed that the correlation value < alpha, both at the level of 1% and 5% for all variables tested, the conclusions obtained are social media and Spiritual Discipline has valid data.
Test Reliability

The test results showed that the Cronbach alpha values of all variables tested had values> 0.6, the conclusions obtained is social media (0.885), spiritual discipline (0.734), to have reliable data.

From the results of hypothesis testing concluded that there is a positive and significant relationship between social media and the use of spiritual disciplines in high school students throughout Indonesia. From the results of this study concluded that there are significant positive and significant correlation between social media users against spiritual discipline is strong. And the influence of 0.885 indicates that there is a positive influence between the use of social media to the spiritual disciplines in high school across Indonesia amounted to 0.734 and the balance of 0.264 is determined by other variables eg Bible study, participation in school organizations mapun spirituality in the church and family.

Partially, social media affects 88.5%, against the spiritual discipline of learners 73.4%. The results of the analysis proved that social media influence the spiritual discipline of students.

The use of social media influence linerietas the spiritual disciplines in high school across Indonesia, the better the application of the use of social media the better the spiritual disciplines in high school students throughout Indonesia.

III. CONCLUSION

A. Conclusion

Based on the research results, it can be drawn several conclusions, among others:

1. Social media makes it easy for people to interact, with the main purpose of facilitating a user or users of social media to connect with someone in one country or even between countries and continents, with practical and does not waste time or make it easy for the user.
2. The user can easily participate, sharing mutual giving and receiving information, keep in touch friends, post writing, upload videos and photos and comment on it.
3. The teens in use should continue to be supervised and directed so as not to get stuck in the wrong usage.
4. All students are expected to apply spiritual discipline in the young life. (No time to pray, read the Word of God)

B. Recommendation:

Based on the conclusions and findings of the research, then put forward the following recommendations:

1. For Teachers

   To every teacher of Catholic Religious Education in order to keep providing direction and guiding individual learners in using social media, especially useful for teaching religious education.
   2. For Schools

   Making social media as technology-based learning media so as to assist in the learning process. There needs to be trained or socializateded learners
   3. For Students

   So that the use of social media in a positive way, for example, to share information to increase knowledge, making social media as a means of learning

4. For Parents

   The role of parents is also very important in terms of supervising, guiding and directing the children to remain wise in the use of social media, especially at home.

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Isolation and Production of Inulinase From Banana Peel by Using Aspergillus Niger Under Submerged Fermentation

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Abstract- Inulinase consist of an important class of enzymes for the production of fructose and fructo-oligosaccharides, which are extensively used in pharmaceutical, food industry and beverages. Inulinase have also found their application in inulin substrates hydrolysis for single-cell oil and single-cell protein production. The isolated fungus was identified as Aspergillus niger. It has been isolated from numerous habitats. This enzyme is found in many plants species and is widely distributed in fungi, yeast and bacterial strains. In the present study, rhizosphere soil samples were collected and inoculated for the isolation of fungal species present in soil. A local fungal isolate identified as Aspergillus niger was tested for the optimization of inulinase production in solid state fermentation and submerged fermentation for various parameters such as pH, temperature, incubation time, carbon and nitrogen sources. Five different substrates wheat bran, banana peel, orange peel, sugarcane bagasse, garlic peel were used. Among five banana peel substrate resulted in maximum production of inulinase for incubation time in days. The inulinase production using banana peel as substrate was higher in submerged fermentation (61 U/ml) than solid state fermentation (52 U/ml). The optimum pH and temperature was found to be 5.4 and 37°C respectively. In submerged fermentation inulinase showed higher activity when inulin (72 U/ml) with respect to sucrose (67 U/ml) was used as carbon sources. Yeast extract showed higher activity in submerged fermentation (66 U/ml) was used as nitrogen sources.

Index Terms- Inulinase, Submerged fermentation, Aspergillus niger, inulin, Banana peel.

I. INTRODUCTION

The agro-industrial residues such as coffee husk, wheat straw, pineapple waste, mixed fruit, maosmi waste, sugarcane bagasse, banana peel, rice bran, wheat bran, and kiwi fruit peel have been investigated for their potential to be used as substrates. Inulinase is one of the most important enzymes in food processing industries mainly for extraction and clarification of high fructose syrups, fructo-oligosaccharides, ethanol and inulooligosaccharides.

Banana is a fast growing and high biomass yielding plant. India is the largest producer of banana next to mango. Banana has a protective outer layer (a peel or skin) with a fleshy, edible inner portion. Banana peels waste are readily available as agricultural waste, yet they seem to be under utilized as a potential growth medium for local yeast, fungi strains, despite their rich carbohydrate content and other basic nutrients that can support fungi growth. It contains 50% cellulose, 25% hemicelluloses and 25% lignin which can be easily utilized by the fungus for metabolism. The indigenous yeast and fungi with good fermentation attributes, which may enhance ethanol yield and other enzyme and minimize cost of production, could be obtained from ripe banana peels.

Aspergillus which includes a set of fungi that are generally considered asexual, although perfect forms (forms that reproduce sexually) have been found. Aspergillus niger which is distinguished by its black spores, so that it usually called Black Mold. They are geographically widely distributed, and have been observed in a broad range of habitats because they can colonize a wide variety of substrates. Aspergillus niger is commonly found as a saprophyte growing on dead leaves, stored grain, compost piles, and other decaying vegetation.

The spores are widespread, and are often associated with organic materials and soil. The primary uses of Aspergillus niger are for the production of enzymes and organic acids by fermentation. While the food, for which some of the enzymes can be used in preparation. The fungi are heat tolerant filamentous fungus. Aspergillus niger was used for the optimization of inulinase production parameters in solid state fermentations and also to clarify the specific fungal strain with the best enzyme (Inulinase) production activity.

Sources of Inulinase:

Inulin can be produced from a wide array of organisms including plants, bacteria, molds and yeast. Inulin is predominantly found in plants belonging to either Liliaceae, (e.g., leek, onion, garlic and asparagus). Dandelion, Chicory and Jerusalem artichoke have been proven to contain inulinase that can be extracted and purified, but according these plant sources are not as productive as the microbial ones, which seem to be the only source capable of producing enough enzymes for industrial applications. For this reason, in the last three decades, significantly efforts have been made to find the best microbial source for the extraction of inulin. A number of fungal, yeast, and bacterial strains have been used for the production of inulinase. Among them, fungal strains belonging to Aspergillus sp. and Penicillium sp. and yeast strains belonging to Kluyveromyces sp. (diploid yeast) are apparently the most common.

Classification of Inulinase

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Inulin is hydrolyzed by enzymes known as Inulinase. Endo-inulinases and Exo-inulinases are glycosidase that perform the endo-hydrolysis and exo-hydrolysis of 2, 1-β-D-fructosidic linkages (β-2, 1-fructanlinks) in inulin. It is clear from the literature that two different actions can be exerted by inulinase on inulin molecules: an external action and an internal action, the corresponding two kinds of inulinase are called exo-inulinase and endo-inulinase.3 & 5

Exo-inulinase splits of the terminal fructose units from inulin, exo-inulinase action begins with the separation of the first D-fructose molecule and goes on until the last linkage within the molecule of inulin is broken and a molecule of D-glucose is released. Exo-inulinases (β-D-fructo hydrolase), split terminal fructose units in sucrose, raffinose and inulin to liberate fructose.10

Endo-inulinase breaks down inulin into inulo-oligosaccharides (IOSs), it acts on the internal linkages and yields a set of inulo-oligosaccharides5. Endo-inulinases (2, 1-β-D-fructan fructo hydrolase) are specific for inulin and hydrolase it by breaking bonds between fructose units that are located away from the ends of the polymer network, to produce oligosaccharides. The property of having an exo- or an endo-action depends on the microbial origin of the enzyme.2

Figure 1: Schematic Structure of inulin structure.13

Figure 2: Action of Exo-inulinase
In the present study, *Aspergillus niger* was isolated from soil sample and screened for production of Inulinase from food waste. Inulinase production had been reported to be produced in submerged fermentation. The optimization of inulinase production by incubation time, pH, temperature, carbon sources, nitrogen sources, while using the food waste as substrate also had been studied.

II. MATERIALS AND METHODS

Isolation and screening of inulinase producing fungi

Fungus was obtained from rhizosphere soil for the study which was collected in sterilized petriplates of different rhizosphere region (from village). Isolated fungus was maintained on PDA media slants at 27°C and subculture every month and stored at 4°C. The strain which produced zone of clearance was taken. The medium which was used for screening composed of - Inulin-10gm, Yeast extract-10g, NaNO₃-10g, KH₂PO₄-5g, MgSO₄.7H₂O-1g, Agar - 15g, Distilled water -1 liter, pH- 5.9

Submerged Fermentation

Submerged fermentation of food waste (banana peel) was carried out on a rotator shaker at 150 rpm at 37°C in 250ml of Erlenmeyer flask that filled nutrient solution. It was autoclaved at 121°C for 20 minutes. That flask was inoculated by *Aspergillus niger* spores. The samples were collected after 3, 6, 9 and 12 days. The samples were centrifuge at 5000 rpm for 15 minutes. The supernatant was used as enzyme extract and used for enzyme assay.

III. OPTIMIZATION OF INULINASE ENZYME PRODUCTION

Effects of pH on Inulinase activity

To determine the optimal pH, inulinase activity was measured over a pH range of 4 to 5.6 using inulin as substrate. Sodium acetate buffer was used to obtain the pH gradient. Sodium acetate buffer with different pH ranges (4, 4.4, 5, 5.4 and 5.6) was prepared, and then 1 gm of substrate (inulin) was dissolved in 100 ml of each previous buffer with pH range (4 to 5.6) to substrate concentration1%. 0.1 ml of crude enzyme (enzyme extract) was added to 0.9 ml of inulin solution in test tubes, and the mixture was incubated for 15 min. in water bath at 50°C. The reaction was stopped by adding 1ml of 3, 5 dintro salicylic acid solution. All tubes were boiled in boiling water bath for 5 min., then directly cooled in cold water bath. 10 ml of distilled water was added to each tube, and mixed well. Absorbance was read at 540nm.

Effects of temperature on Inulinase activity

The effect of temperature on inulinase activity was examined over a temperature range .The substrate solution(0.9ml) was added to 0.1ml of enzyme solution and incubated for 15 minute at different temperatures (0, 20, 27, 37 and 50 °C), then the activity was estimated. The reaction was stopped by adding 1ml of 3, 5 Dintro salicylic acid solutions. All tubes were boiled in boiling water bath for 5 min., then directly cooled in cold water bath. 10 ml of distilled water was added to each tube, and mixed well. Absorbance was read at 540nm.

Effects of carbon sources on Inulinase production

To study the effect of different carbon sources on Inulinase production, about 10 gm of each substrate was transfer separately into four conical flasks. They were further supplemented with different carbon sources such as sucrose, glucose, lactose and maltose. Then the fungal spore suspension was inoculated and the flasks were incubated at pH-5.4 and 37°C for 3 days and enzyme assay was done.

Effects of nitrogen sources on Inulinase production

To study the impact of different nitrogen sources on inulinase production, about 10 gm of each substrate was transferred separately into four conical flasks. They were further supplemented with different nitrogen sources such as yeast extract, peptone, ammonium nitrate, and potassium nitrate. Flasks were inoculated with 1ml of fungal spore suspension and then incubated at pH-5.4 and 37°C for 3 days and enzyme assay was done.
Enzyme Assay Method

Inulinase activity was determined by the method. A blank was also prepared that does not contain enzyme. 0.1 ml of crude enzyme (enzyme extract) was added to 0.9 ml of inulin solution in test tubes, and the mixture was incubated for 15 min. in water bath at 50°C. The reaction was stopped by adding 1ml of 3, 5 dinitro salicylic acid solution. All tubes were boiled in boiling water bath for 5 min., then directly cooled in cold water bath. 10 ml of distilled water was added to each tube, and mixed well. Absorbance was measured in spectrophotometer at 540 nm, and then enzymatic activity is determined by depending on fructose standard curve. One unit of Inulinase activities defined as amount of enzyme that is needed to produce 1 mol of fructose (reducing sugar) per minute.

IV. RESULTS, OBSERVATIONS AND DISCUSSION

Isolation of the fungi

The fungus was successfully isolated from the rhizosphere soil on PDA. The fungi culture was identified as *Aspergillus niger* on the basis of its morphological characteristics. *Aspergillus niger* which was distinguished by its black spores, so that it usually called Black Mold and They were geographically widely distributed, and was observed in a broad range of habitats because they can colonize a wide variety of substrates. The isolated fungus identified as *Aspergillus niger* species was screened for inulinase production on PDA containing inulin. The petriplates and slants containing fungal culture showed the formation of Black spores zones around the fungal colonies.

Production of inulinase under Submerged fermentation for different food wastes

In submerged fermentation *Aspergillus niger* was cultivated on different food wastes (banana peel, sugarcane bagasse, orange bagasse, garlic peel and wheat bran). The enzyme activity was measured from the third day of incubation and further reading was taken after an equal interval of three days. The enzyme activity in submerged fermentation of different inulin waste by *Aspergillus niger*. *Aspergillus niger* growing on banana peel showed the highest enzyme activity of 62 U/ml on 9th day as compared to different substrates such as wheat bran (61 U/ml), orange peel (36 U/ml), sugarcane bagasse (41 U/ml), and garlic peel (36 U/ml) at 9th day of incubation. (Figure-4).

Production of inulinase under submerged condition

The isolated fungus was cultivated on nutrient medium and enzyme activity observed from third day of incubation and mean after three days interval. The activity was higher at 9th day of incubation (Figure-5). Highest activity measured was 61 U/ml.

Effect of temperature on inulinase activity

The effect of temperature on inulinase activity was examined over a temperature range. The substrate solution (0.9ml) was added to 0.1ml of enzyme solution and incubated for 15 minute at different temperatures (0, 20, 27, 37 and 50) °C, and then the enzyme activity was measured. The reaction was stopped by adding 1ml of 3, 5 dinitro salicylic acid solution. All tubes were boiled in boiling water bath for 5 min., then directly cooled in cold water bath. 10 ml of distilled water is added to each tube, and mixed well. Absorbance was read at 540nm. Inulinase enzyme showed maximum activity at 37°C was noted as optimum temperature. The inulinase produced by *Aspergillus niger* showed the highest activity at 37°C (Figure-6).

Effect of pH on inulinase activity

Inulinase activity was measured over a pH range of 4 to 5.6 using inulin as substrate. The pH gradient was obtained by sodium acetate buffer. Sodium acetate buffer with different pH ranges (4, 4.4, 5, 5.4 and 5.6) was prepared. 1 gm of substrate (inulin) was dissolved in 100 ml of each previous buffer with pH range (4 to 5.6) to substrate concentration 1%. The optimal pH was found to be 5.4 for inulinase. The inulinase production from *Aspergillus niger* was active in pH range 5 to 5.6, and exhibiting the highest activity at 5.4 pH (Figure-7).

Effects of carbon sources on inulinase production

Four carbon sources (glucose, sucrose, lactose and maltose) were tested against inulin for inulinase production. The flask was maintained as control inulin was found to be carbon source in comparison to other sources. Inulinase production was studied for substrate with carbon sources in the nutrient solution. In submerged fermentation inulinase showed higher activity when inulin (72 U/ml) with respect to sucrose (67 U/ml) was used as carbon sources showed in (Figure-8).

Effects of nitrogen sources on inulinase production

Various nitrogen sources (peptone, ammonium nitrate, yeast extract and potassium nitrate) were added along with nutrient solution to the solid and submerged substrates. The presence of Yeast extract effectively produced maximum inulinase activity by *Aspergillus niger* with Yeast extract produced maximum inulinase activity in banana peel under submerged fermentation (55 U/ml) in (Figure-9). But potassium nitrate and ammonium nitrate had an inhibitory effect on inulinase production compared to the others.
Figure 4: Inulinase activity of *Aspergillus niger* in submerged fermentation of different food wastes [enzyme activity (U/ml) v/s incubation time (days)].

Figure-5: The activity of inulinase produced by *Aspergillus niger* after particular days of incubation under submerged condition [enzyme activity (U/ml) v/s incubation time (days)].
Figure 6: Effect of temperature on activity of inulinase from *Aspergillus niger* [activity (U/ml) v/s temperature (degree)]

Figure 7: Effect of pH on activity of inulinase from *Aspergillus niger* [enzyme activity (U/ml) v/s pH].
Figure 8: The enzyme activity reached the maximum in particular carbon source under submerged condition [enzyme activity (U/ml) v/s carbon sources].

V. CONCLUSION

In this study, the Inulinase production using banana peel as substrate was higher in submerged fermentation (61 U/ml) than solid state fermentation (52 U/ml). The optimum pH and temperature was found to be 5.4 and 37°C respectively. In submerged fermentation inulinase showed higher activity when inulin (72 U/ml) with respect to sucrose (67 U/ml) was used as carbon sources. In solid state fermentation inulinase showed higher activity when inulin (55 U/ml) with respect to sucrose (50 U/ml) was used as carbon source. Yeast extract showed higher activity in both solid state (55 U/ml) and submerged fermentation (66 U/ml) when it was used as nitrogen source. This study clearly indicates that using pure inulin is costlier so research is the way to limiting the cost and for the commercialization is possible to scale up the inulinase production by *Aspergillus niger* through submerged fermentation. Banana peels can be used as alternative...
feed stocks in the production of microbial inulinase using a more economical method.

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Does Financial Compensation Will Influence To Employees’ Loyalty?

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\textsuperscript{b} Universitas Bakrie

Abstract- A company can survive if in all their activities are supported by a high loyalty from his employees. The existence of the compensation received by employees, a comfortable working environment, as well as the burden of work in accordance with the capabilities of the factors that could cause employees last longer in the organization and creates a feeling of satisfaction in doing any work. The purpose of this study is to analyze the influence of compensation on employees’ loyalty. Data collection using interviews with the help of a questionnaire instrument which the employees of PT.XYZ were taken as target respondents. Both primary and secondary data were gathered. Secondary data were gathered from various sources such as journals, books and other related publications. Primary data were collected using questionnaire which were distributed to the target respondents. Using a purposive sampling technique, a total of 30 respondents were gathered. Various statistical tests such as validity, reliability and classical assumptions tests were employed. Using a regression analysis, it was found that compensation had a positive and significant effect on employees’ loyalty, both partially and simultaneously. It is suggested that PT.XYZ should increase its compensation both financial and non-financial so it will increase the employees’ loyalty as well. Further research on other variables such us motivation, organizational structure, and supervisor’s quality will provide a better pictures about factors that affect customer satisfaction.

Index Terms- financial compensation, loyalty

I. INTRODUCTION

It is common knowledge that the employee and the company is an integral part. Employees who are healthy will increase the company's productivity. There are three main resources used by the company in achieving its objectives, capital, people and machines. If all of these resources can be managed properly, it will be easier for companies to achieve their goals. The resources are the most important role of human resources. Human resources affects the efficiency and effectiveness of the organization, human resources designing and producing goods and services, oversee the quality, market products, financial allocate resources, and determine the whole purpose and strategy of the organization (Rachmawati, 2008:82).

PT.XYZ is a company engaged in the field of online service, as the restaurant reservation platform. As a partner of the company, employees are always given the opportunity to discuss and express ideas to the management. Kompas Cyber Media (2007:2) released the results of a survey 2007/2008 Global Strategic Rewards conducted Watson Wyatt found that employee turnover has been a problem firms in Indonesia, because what often happens is performing employees who easily move higher the company. Jewell (1998:55) in Ravii (2008:24) argues turnover intention is divided into two types. First, involuntary employee turnover which is an involuntary discharge and a second, voluntary employee turnover is a voluntary discharge.

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
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<td>Q1</td>
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<td>4</td>
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<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Q3</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Q4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

(Source: PT.XYZ)

Quoted from the formula in Payscale.com, were calculated from Table 1 and get the turnover rate in 2013 amounted to 26.08% and in 2014 by 40%. These values are above the average turnover rate in Indonesia amounting to 15% according to a survey of Pricewaterhouse Cooper (PwC) in 2014. Turnover Intention high attention of companies as intrusive surgery, childbirth moral problems on employees who live, and also inflate costs in recruitment, interviewing, testing, reference checking, the administrative costs of processing new hire, benefits, orientation, and the cost of lost opportunity for new employees must learn new skills (Simamora, 2006:83).

PT.XYZ experienced turnover intention of magnitude above the average compared to other companies in Indonesia. This is one of the characteristics of the low employee loyalty. Employee loyalty is influenced by several factors, one of which is the compensation system in PT.XYZ. Therefore, the purpose of this study is to determine the impact of financial compensation to employees loyalty at PT.XYZ.

II. LITERATURE

Compensation

According Hasibuan (2007:121) compensation is all the income in the form of money, goods, directly or indirectly received by employees as a reward for services rendered to the company. When appropriate compensation policy formulation,
both in terms of fairness and feasibility, then the employees will feel satisfied and motivated to carry out various activities related to the achievement of the company. Conversely, when a sense of fairness and feasibility are not met will make employees complain and job dissatisfaction arises which affects the deterioration of morale which in turn causes the employee's performance will decline as well.

Compensation System
Hasibuan (2008:118), states that the compensation system is often applied as follows:
1. System Time
   In this system set based on a standard time such as hours, weeks, or months. The system time can be easily applied to permanent employees or employees daily.
2. System Outcomes (output)
   In the system's results or output, compensation is set on the unity of workers of units produced, such as the per-piece, meter, liter and kilogram. The system is only suitable for employees at the production of goods.
3. Wholesale System
   Wholesale system is a way of determining the amount of remuneration which the services are based on the volume of work and long to do, and a lot of the necessary tools to solve them.

Loyalty
According Oetomo (2006:15), loyalty is a sense of responsibility, not only the responsibility but also feeling more than a sense of responsibility that has a sense of belonging. If an employee execute the orders of superiors, it does not mean merely following orders, but also can provide meaningful input and the best for the company. Loyalty according Hasibuan (2008; 94) is reflected by the willingness of employees to maintain and defend the organization inside and outside of work. The category loyalty of employees to jobs, positions, and the company is one of the elements considered in the assessment of achievement.

Compensation Relationship Loyalty
According to Handoko (2010:84), "the importance of complementary or indirect compensation payment will benefit the company, one of which is to improve employee morale and loyalty to the company". This is reinforced by the opinions Rival (2009: 211) states that compensation will help the company to achieve its objectives and obtaining, maintaining, and keeping employees well if properly managed. Based on that, then the compensation will affect employee satisfaction and even passion in their work. This will affect the level of employee’s loyalty at the company or organization. If compensation is given properly by the company, it will increase employee satisfaction and employee loyalty is also high. And conversely, if the compensation awarded is not feasible, the employee's performance will decline even decreased drastically, it will affect employee loyalty to the company or organization. Thus, the compensation given by the company to employees can influence employee loyalty (Robbins, 2008: 241)

III. FRAMEWORK RESEARCH
Compensation consists of financial and nonfinancial compensation (Riva, 2008:20). According to Robbins (2009:55), if compensation is given properly by the company, will increase employee satisfaction and employee loyalty is also high. And conversely, if the compensation awarded is not feasible, the employee's performance will decline even decreased drastically, it will affect employee loyalty to the company or organization. Therefore, the compensation given by the company to employees can influence employee loyalty. In this research, financial compensation, either directly or indirectly, be used as independent variables and employee loyalty as the dependent variable.
IV. HYPOTHESIS

Conceptual hypothesis in this study is among the influences of financial compensation, financial compensation either direct or indirect financial compensation, to the loyalty of employees, which include obedience, honesty, responsibility and devotion.

OPERATIONAL VARIABLE

The variable is anything that becomes the object of observation in the study which contains a concept that has a variation value. The variables used in the study should be defined operationally. The variables that will be used in this research are:

a. The independent variables (independent) is the variable that the cause of the occurrence or its impact on the dependent variable (Umar, 2010:36). In this case, the independent variable used is the company's compensation on the employee.

b. The dependent variable (dependent) is a variable whose value is affected by the independent variable (Umar, 2010:36). In this case, the dependent variable used is employee loyalty to the company.

RESEARCH METHODOLOGY

Methods of data collection by the author in this study are:

a. Mechanical Research Library (Library Research). Author secondary data from the theoretical literature journals, books basic theory of human resources, magazines, articles, journals, and internet.

b. Mechanical Field Research (Field Research). In this technique the author conducted field research in two ways: Interview Techniques: authors came and direct interviews with parties interested in the company. The result is data such as company profile, organizational structure, and information on the compensation given by the company. Techniques Questionnaire: writer distributing questionnaires containing questions about the compensation given by the company and employee loyalty to the respondents were selected randomly (random).

V. DISCUSSION

HETEROSKEDASITAS TEST

Heteroskedastisitas test is intended to test whether the regression model occurred inequality variance of the observation by other observations. If the variance of residuals in one observation to observation the other remains then called heteroskedastisitas. While if the variance of residuals in one other observation to different observation then called heteroskedastisitas. A good regression model is when there heteroskedastisitas or not happen heteroskedastisitas.
In the scatterplot graph heteroskedastisitas test above, it can be seen that there is no clear pattern, which means there was no trouble heteroskedastisitas.

**NORMALITY TEST**

The test is performed using graphical analysis of normal P-P plot. Analysis using normal graphs P-P plots by looking at normal probability plots comparing the cumulative distribution with a normal distribution. The normal distribution will form a straight diagonal line and residual plotting the data will be compared with diagonal lines. If the distribution of residual data is normal then the line that represents the actual data will follow a diagonal line. The test results using graphical analysis of normal P-P plot can be seen in the image below:

![Normal P-P Plot of regression Standardized Residual Dependent Variable: y](image_url)

**Figure 3**

The test results using a normal P-P graph plots indicate that the data points are spread around the diagonal line, and it can be
concluded that the data is normally distributed and regression model to meet the assumption of normality.

HYPOTHESIS TEST
Hypothesis test results can be seen in Table 2 below:

<table>
<thead>
<tr>
<th>Table 2. Result of hypothesis Test</th>
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<tbody>
<tr>
<td>Beta</td>
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<tr>
<td>-------</td>
</tr>
<tr>
<td>(Constant)</td>
</tr>
<tr>
<td>Compensation</td>
</tr>
<tr>
<td>Regression</td>
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</tbody>
</table>

T STATISTIC TEST
T test was used to test how much influence (contribute) partially independent variables on the dependent variable. Table 2 shows that sig for compensation is of 0.00 which value is less than 0.05. This means that the compensation significant effect on employee loyalty.

COEFFICIENT DETERMINATION (R²)
The coefficient of determination used to indicate how large percentage of the influence of the independent variable on the dependent variable in a study. From table 2 it can be seen that the R² value is 0.599, or by 59.9%. That is, the variables affecting employee loyalty variable compensation amounted to 59.9%, and the remaining 40.1% is influenced by other variables that are not mentioned in this study.

Hypothesis test results showed that the variable compensation has a positive coefficient of 1.370 with a significance value of 0.00. The significance value is smaller than the set value is 0.05, meaning that compensation significant effect on employee loyalty, then H1 is accepted. Compensation has a positive coefficient beta value of 1.370 to the loyalty of employees, which indicates that if compensation increases by 1 unit, then the level of loyalty of employees will rise by 1.37 units. This means that the higher the compensation given by the company it will have an impact on increasing employee loyalty, and vice versa.

VI. CONCLUSION
From the above results it can be concluded that the compensation effect on employee loyalty. The high turnover of employees at PT.XYZ be an indication of lack of employee loyalty caused by the low level of compensation as well. Based on the results of research on the impact of compensation on employee loyalty PT.XYZ, it can be concluded that compensation is positive and significant effect on loyalty employees. This is consistent with the stated Robbins (2009:98), if compensation was given properly by the company, it will increase employee satisfaction and employee loyalty is also high. And conversely, if the compensation awarded is not feasible, the employee's performance will decline even decreased drastically, it will affect employee loyalty to the company or organization. Therefore, the compensation given by the company to employees can influence employee loyalty. Things can be done by PT.XYZ Company relating to financial compensation among which are salary increases, bonuses, improved health facilities, or additional vacation time. As for the related non-financial compensation, PT.XYZ can provide a healthy working environment, the office atmosphere is pleasant, and promotional opportunities for its employees.

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Balancing Current and Efficiency Modelling of Single Switch Active Balancing Systems for Energy Storage Systems

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Abstract- High Power battery packs are a series/parallel connection of single energy storage cells. The series connection of cells affects in the whole battery pack energy and power due to the unbalancing behavior of each different cell. To improve the whole battery pack energy a balancing system is connected. Passive balancing systems are wasteful and do not increase the Battery pack energy during discharge. Active balancing systems are efficient but most topologies add big complexity to the BMS work. Single switch active balancing systems are simple and reliable. During this work the main balancing current modelling and efficiency equations are presented for the most important single switch active balancing systems. These expressions permit to evaluate the balancing power of the system, and to know how much energy is balanced during the balancing system process between the Weak cell and the Strong cells. Experimental validation of each balancing system is implemented to compare balancing power, efficiency and behavior.

Index Terms- Active balancing systems, Battery management systems, Energy conversion, Energy efficiency, Energy storage.

Nomenclature

\[ n \] Number of series connected cells [\( \Box \)]
\[ V_{PACK} \] Battery pack voltage [V]
\[ V_{B,i} \] \( i \)th cell voltage [V]
\[ V_{W,i} \] \( W \)th weak cell voltage [V]
\[ V_{S,i} \] \( S \)th strong cell voltage(s) [V]
\[ D_{cri} \] Critical duty cycle ratio[
\[ D \] Working duty cycle ratio[
\[ T_s \] Switching period [s]
\[ I_{B,i} \] \( i \)th cell ideal balancing current [A]
\[ I_{W,i} \] \( W \)th weak cell ideal balancing current [A]
\[ I_{S,i} \] \( S \)th strong cell ideal balancing current [A]
\[ P_{B,i} \] \( i \)th balancing system ideal power [W]
\[ P_{B,T} \] Total ideal balancing system power [W]
\[ I_{B,i}^\prime \] \( i \)th cell real balancing current [A]
\[ I_{W,i}^\prime \] \( W \)th weak cell real balancing current [A]
\[ I_{S,i}^\prime \] \( S \)th strong cell real balancing current [A]
\[ P_{B,i}^\prime \] \( i \)th balancing system real power [W]
\[ P_{B,T}^\prime \] Total balancing system real power [W]
\[ P_{Loss,T} \] Total balancing system power loss [W]
\[ \eta \] Balancing system efficiency [%]

\[ V_{PS,i} \] \( i \)th power supply voltage [V]
\[ I_{PS,i} \] \( i \)th power supply current [A]

I. INTRODUCTION

Driven by nowadays increase of power and energy demand several continental, national and regional energy strategy plans have been developed with the main issue of decreasing primary energy sources and increase insertion of renewable energies, decrease CO\textsubscript{2} emissions and increase energy efficiency [1], [2].

Energy storage systems ESS are the main technology to help increasing the impact of renewable energy, as wind energy and photovoltaic generation[3]–[15], or the insertion of the hybrid and electric car[16]–[21]. Inside ESS systems battery based energy systems are one of the most promising technologies. High power battery packs are a series/parallel connection of single battery cells or small battery modules[22]–[27].

Series connection of battery cells have an unbalancing effect in the battery pack, due to differences between cells [28]–[31], inducing a total battery energy and performance reduction[32], [33].

Passive balancing is the most used balancing technique, but it is wasteful and the balancing procedure is only useful during charge process[34]–[36].

Active balancing systems are more efficient but are complex, with high number of switching devices, which increase the price and decreases the competitiveness of these devices[37]–[44]. To decrease the complexity of active balancing systems single switch balancing topologies are a great option[45], [46]. A single switch is used to balance all the cells, with the possibility of controlling the active switch with an open loop strategy.

In the present work, a generalized description of main single switch topologies for active balancing systems will be given. The main goal of the present work is to model the current of the active balancing systems shunted from each single cell. It is the main parameter in the design and sizing of the balancing system. The efficiency of the balancing system is also modelled, to know the power loss respected to the ideal current model.

As the first step in section II, main single switch balancing topologies and modelling equations will be presented. These equations are the main part for the balancing system sizing.

In section III, power losses of the single switch balancing circuits are modelled. The power losses of balancing circuits are of great impact and interest in balancing systems because they
manage low balancing power and the losses have big influence on the balancing currents. With the power losses the balancing currents are recalculated.

During section IV, experimental results of real prototypes will be presented and compared to modelling results. Special interest will be presented regarding power losses and efficiency of the prototypes.

Ideal modelling of single switch balancing topologies

Open loop Discontinuous Conduction Mode DCM

Single switch active balancing topologies must guarantee the DCM to work in an open loop control mode.

\[
D_{on} + D_{off1} + D_{off2} = T_x \\
D_1 + D_2 = 1 \\
D_2 \geq 0
\]

The critical duty cycle ratio Dcri is the maximum working duty cycle Dto guarantee the DCM. Dcri is defined when the value of the zero current period D2 is zero.

\[
D_{cri} = 1 - D_1, \quad \text{for } D_2 = 0
\]

The only requirement to guarantee the DCM mode is to keep D behind or equal to Dcri.

D ≤ Dcri, \quad \text{for } \text{DCM}

Ideal current modelling of single switch balancing topologies

Single switch balancing system topologies perform voltage based balancing. The balancing system equals all the voltages of the series connected cells by the natural topology behavior. When the voltage is equal in all n series connected cells, no balancing current I_{B,i} is injected or extracted from the cells.

\[
I_{B,i} = I_{B,S} = \ldots = I_{B,n}, \quad I_{B,i} = 0
\]

When a voltage unbalance occurs, the cell with the lowest voltage V_{B,W}, for now on Weak cell, receives energy from the higher voltage cells V_{B,S}, henceforth Strong cells.

\[
V_{B,S} > V_{B,W}, \quad I_{B,S} < 0 \quad \text{give energy}
\]

During the ideal current modelling, the balancing current I_{B,i} of each single series connected cell will be defined under a voltage unbalanced condition, with one Weak cell and (n-1) Strong cells.

The maximum D_{cri} will be defined respect to the Weak cell voltage V_{B,W} and the Strong cell voltages V_{B,S}. All cells that are not considered Weak are considered Strong cells.

The battery pack voltage V_{PACK} is defined as the sum of each single cell voltage V_{B,i}, or the sum of the Weak cell voltage V_{B,W} with the Strong cell voltages V_{B,S}.

During a complete switching period the generalized equations that determine the mean AV and the root mean square values of the switching variables are expressed by

\[
X_{AV} = \frac{1}{T_x} \int_{0}^{T_x} X(t) \, dt
\]

For an isolated single cell

\[
X_{rms} = \sqrt{\frac{1}{T_x} \int_{0}^{T_x} X^2(t) \, dt}
\]

The topologies under study are 3 flyback based topologies and 3 buck-boost. The main parameters of these topologies regarding number of components and balancing behavior are presented in Table I.

<table>
<thead>
<tr>
<th>Topology</th>
<th>S</th>
<th>D</th>
<th>C</th>
<th>L</th>
<th>T</th>
<th>Selective</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLY_1PnS</td>
<td>1</td>
<td>n</td>
<td>n+1</td>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>FLY_{n}PnS</td>
<td>1</td>
<td>n</td>
<td>n+1</td>
<td>n</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>SEPIC</td>
<td>1</td>
<td>n</td>
<td>n+1</td>
<td>n</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>ZETA</td>
<td>1</td>
<td>n</td>
<td>n+1</td>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Isolated CUK</td>
<td>1</td>
<td>n+1</td>
<td>n+1</td>
<td>1</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

\[
V_{PACK} = \sum_{i=1}^{n} V_{B,i} = V_{B,W} + \sum_{i=1}^{n-1} V_{B,S}
\]

During section IV, experimental results of real prototypes will be presented and compared to modelling results. Special interest will be presented regarding power losses and efficiency of the prototypes.

Ideal modelling of single switch balancing topologies

Open loop Discontinuous Conduction Mode DCM

Single switch active balancing topologies must guarantee the DCM to work in an open loop control mode.

\[
T_x = T_{on} + T_{off1} + T_{off2}
\]

The energy is inserted during T_{on}, and the Weak cell voltages VB,W, henceforth receive energy from the Strong cell, during T_{off1}, and give energy during T_{off2}.

The battery pack voltage is defined as the sum of each single cell voltage V_{B,i}, or the sum of the Weak cell voltage V_{B,W} with the Strong cell voltages V_{B,S}.

\[
I_{B,W} = \frac{V_{PACK} D^2 T_s}{2L} \left( \frac{V_{PACK}}{V_{B,W}} - 1 \right)
\]

\[
I_{B,S} = -\frac{V_{PACK} D^2 T_s}{2L}
\]

Fig. 1 FLY_1PnS main balancing current waveforms and equations.
During Appendix the main current waveforms of the battery cells will be presented under different unbalancing effects.

**FLY\_nPnSP**

The **FLY\_nPnSP** is a flyback based design with \( n \) magnetic cores connected in parallel in the primary. The secondary of the \( n \) magnetics core is connected to each series connected cell. The main advantages are the modularity of the design and the high current capability, although it has high power losses due to high current necessity to magnetize all transformers. The current waveforms could be analyzed under different unbalancing situations in Appendix.

During \( T_{ON} \) all the magnetizing inductances \( L \) are charged with the battery pack voltage \( V_{PACK} \) inducing a big current through all the series connected cells. During \( T_{OFF} \), the voltage of the \( Weak \) cell is reflected in the primary by the transformer ratio \( N \), so all the energy stored in all the magnetizing inductors is released to the \( Weak \) cell.

The \( Strong \) cells inject energy to the circuit during \( T_{ON} \) decreasing their total energy. During \( T_{OFF} \) there is not energy

---

**Fig. 2.** **FLY\_nPnSP** main balancing current waveforms and equations.

\[ V_{PACK} L_s D_s = \frac{N V_{B,W}}{V_{PACK} + N V_{B,W}} \]  
\[ I_{B,W} = \frac{V_{PACK} D_s T_n}{2L} \left( \frac{V_{PACK}}{V_{B,W}} - 1 \right) \]  
\[ I_{B,S} = -\frac{V_{PACK} D_s T_n}{2L} \]  

**Fig. 3.** Main single switch active balancing topologies schematics. a) Flyback with 1 primary and \( n \) secondaries with single core **FLY\_1PnS** b) Flyback with \( n \) primaries and \( n \) secondaries with the primaries connected in parallel **FLY\_nPnSP**. c) Flyback with \( n \) primaries and \( n \) secondaries with primaries connected in series **FLY\_nPnSS**. d) The multistacked Sepic topology **SEPIC**. e) The multistacked Zeta topology **ZETA**. f) The multistacked Cuk topology in the isolated configuration **isolated\_CUK**.
insertion to the Strong cells, so they only suffer energy decrease during $T_{ON}$ balancing the total series connected system.

**FLY**$_n$**PnSS**

The flyback converter **FLY**$_n$**PnSS** is a series connection of $n$ magnetic cores. The transformers are serialized and all magnetized by the same current from the battery pack. The main advantage is the modularity, but the most important drawback is the non-selective behavior.

The magnetizing inductors $L$ of each transformer are charged during $T_{ON}$. During $T_{OFF1}$, the energy introduced to each transformer, is inserted back to each cell with a variable $T_{OFF1}$ time depending on each cell Voltage $V_{B,j}$. The **Weak** cell will have the biggest $T_{OFF1}$ time so it will receive the biggest amount of charge, performing the balancing procedure. In the other hand, the biggest voltage cell or the strong cell, will have the smallest $T_{OFF1}$, receiving less energy than the energy supplies by itself.

Although each cell will have its $T_{OFF1}$ time, the critical duty cycle $D_{cri}$ must be guaranteed for the **Weak** cell voltage $V_{B,W}$.

**SEPIC**

The multistacked based Sepic converter **SEPIC** is a Sepic converter topology with $n$ outputs stacked in series. The analysis of the balancing current $I_{B,i}$ is not obvious so the different waveforms for different balancing situations will be presented in Appendix. The balancing current shape is dependent on the situation of each cell in the series connected string. The current ripple of the current is always bigger in the bottom connected cell.

For the analysis of the mean balancing current $I_{B,i}$, is easier to analyze the circuit in a steady state situation. The capacitor charge balance gives $I_{C,i}=0$, and $I_{Di}=I_{Li}$. The only diode that conducts is the **Weak** cell diode so $I_{D,W}=0$. Finally using Kirchoff’s current law we can determine that the balancing current $I_{B,i}$ is

$$I_{B,i} = I_{D,i} - I_{Lin}$$  \hspace{1cm} (19)

During $T_{ON}$ all the inductors $L_i$ and $L_{in}$ are charged, but during $T_{OFF1}$ only the diode of the **Weak** is polarized inserting all the energy to the **Weak** cell.

The main advantages are the transformer free solution and an easy modularity. The disadvantage is the different instantaneous current through the different series connected cells.

**ZETA**

The **ZETA** is also a multistacked based buck-boost topology. It has the same advantages and disadvantages of the **SEPIC** converter. The instantaneous currents are also different depending on the cell position of the series connected stack. The balancing current ripple is bigger in the top connected cell. The instantaneous currents can also be found in Appendix. Another disadvantage is also the high side switch of the topology.

The balancing current is defined as the **SEPIC** converter in (22), and the analysis of the current in steady state is equal. During $T_{ON}$, $I_i$ and $L_{in}$ are charged and during $T_{OFF1}$ the **Weak**
And each component RMS current should be calculated to correctly determine the power losses and efficiency. The efficiency and power losses are dependent on the working point and the parameters of the converter.
For the non-selective case of the FLY nPnSS the power losses are distributed to all the cells. The lowest voltage cell has bigger power losses that the Strong cells. The power losses \( P_{\text{Loss},T} \) are distributed inversely to the voltage of the cells as

\[
P_{\text{Loss},i} = \frac{P_{\text{Loss},T} \sum_{j=1}^{n} V_{B,j}}{V_{B,i}}
\]

For a balanced situation the equations are different because the ideal balancing power \( P_{B,i} = 0 \), because there is not balancing current in a balanced situation (4).

However in the real situation there is a small balancing power to compensate the power losses of the converter.

The real balancing power of the balancing system \( P_{B,T} \) is only used to compensate the power losses, so the efficiency of the converter is 0 because it does not transfer any energy. The efficiency equation is different for balanced and unbalanced situation.

\[
\eta = \frac{P_{\text{Loss},T} - P_{B,T}}{P_{\text{Loss},T}} \cdot 100 \approx 0
\]

Experimental results

To evaluate the ideal modelling and the power loss and efficiency models presented in Section II and Section III the 6 balancing systems under study have been designed to evaluate modelling equations.

1. Table II
2. Design and Ideal Prototype parameters for a working point of one Weak cell \( V_{B,W} = 2 \) V and 3 Strong cells \( V_{B,S} = 3.65 \) V for 4S1P battery pack \( n = 4 \) switching period \( T_s = 10 \) µs

<table>
<thead>
<tr>
<th>Topology</th>
<th>6. ( I_{B,W} ) [mA]</th>
<th>7. ( D )</th>
<th>9. ( L_n ) [µH]</th>
<th>10. ( L_m ) [µH]</th>
<th>11. ( N )</th>
<th>13. ( I_{B,W} ) [mA]</th>
<th>15. ( D )</th>
<th>17. ( L_n ) [µH]</th>
<th>18. ( L_m ) [µH]</th>
<th>19. ( N )</th>
<th>20. ( N )</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLY_1P4S</td>
<td>400</td>
<td>0.134</td>
<td>16</td>
<td>-</td>
<td>1</td>
<td>500</td>
<td>0.13</td>
<td>12</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>FLY_4P4SP</td>
<td>400</td>
<td>0.134</td>
<td>63</td>
<td>-</td>
<td>1</td>
<td>600</td>
<td>0.13</td>
<td>40</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>FLY_4P4S</td>
<td>100</td>
<td>0.382</td>
<td>15</td>
<td>427</td>
<td>-</td>
<td>144</td>
<td>0.38</td>
<td>10</td>
<td>470</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>SEPIC</td>
<td>400</td>
<td>0.134</td>
<td>66</td>
<td>427</td>
<td>-</td>
<td>365</td>
<td>0.13</td>
<td>68</td>
<td>470</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>ZETA</td>
<td>400</td>
<td>0.134</td>
<td>66</td>
<td>427</td>
<td>-</td>
<td>365</td>
<td>0.13</td>
<td>68</td>
<td>470</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Isolated CUK</td>
<td>400</td>
<td>0.134</td>
<td>66</td>
<td>427</td>
<td>1</td>
<td>365</td>
<td>0.13</td>
<td>68</td>
<td>470</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

The balancing converters are designed for a 4S1P 6.5 Ah LiFePO₄ battery pack, so the series connected cell number is \( n = 4 \). The maximum cell voltage of LiFePO₄ cells is 3.65 V and the minimum cell voltage is 2 V. The converter is designed to inject to the Weak cell a fixed balancing current \( I_{B,W} \) under the biggest unbalancing situation, with the Weak cell voltage \( V_{B,W} \) at 2 V and the rest 3 Strong cells \( V_{B,S} \) at maximum 3.65 V. The battery pack voltage for that unbalancing situation is defined by (6) to \( V_{\text{PACK}} = 12.95 \) V.

The switching frequency \( f_s \) has been defined to 100 kHz, so the switching period \( T_s \) is 10 µs. The Weak cell balancing current \( I_{B,W} \) was defined as 400 mA, except for the FLY_4P4SS which was defined as 100 mA. The parameters to meet these characteristics are defined in Table II. The differences between the designed converter and the real prototypes respect to ideal current modelling are presented.

For the flyback topologies when defined as \( L_n \) in Table II is referred to the magnetizing inductance \( L \). For the magnetic components WürthElektronik devices are used. The transformers are 1:1 relation WE-DD series Power Chokes. The inductors are WE-PD3 SMD Shielded Power Inductors.

The capacitors for the charge transfer of the buck boost topologies are Kemet SMD MLCCs with \( C_{C} = 10 \) µF. The high capacitance value is defined to guarantee a constant voltage during the whole switching period in the capacitor.

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The isolated CUK converter isolation is made by a WE-DD 47 \( \mu \)H magnetizing inductor 1:1 transformer and the capacitor split \( C_{\text{CUK}} = 10 \) \( \mu \)F.

The diodes \( D_n \) are low voltage drop Vishay SL13-E3/61T – Schottky rectifiers. Schottky diodes reduce power losses in low voltage applications.

The low \( R_{\text{DSON}} \) “Power Trench” FDS6682 N-Channel Mosfet of Fairchild Semiconductor have been used as the single switch for the 6 different topologies.

The duty cycle \( D \) is fixed. The DCM is guaranteed for all the operating points because the critical duty cycle \( D_{\text{crit}} \) is calculated for the biggest unbalancing situation.

To switch the power converter in an open loop configuration a GW INSTEK AFG-2005Arbitrary Function Generator has been used. This function Generator gives the versatility of full duty cycle control, 0.01 to 0.99, for a 100 kHz base frequency.

To prove the balancing behavior of the single switch balancing systems an experimental test bench has been designed. The experimental test bench consists of one power supply and a parallel connected resistor \( R_{\text{supply}} \) simulating a single battery cell. The parallel connection of the power supply and the power resistor permits to simulate the two quadrant behavior of a single battery cell. The power supply gives energy when simulating a Strong cell and the resistor absorbs current when current is injected to the Weak cell. The power capability of the \( R_{\text{supply}} \) has to be high enough to absorb all the energy delivered by the balancing system.

To simulate the 4 series connected single cells 2 high performance HamegHM7042-5 power supplies are used. Each power supply has 2 independent voltage outputs where a 3.3 \( \Omega \) high power \( R_{\text{supply}} \) is connected in parallel. After that the simulated battery cells are connected in series to simulate a 4S1P battery pack.

The Hameg HM7042-5 permits to read directly the current \( I_{\text{PS}} \) with 1 mA resolution and the voltage \( V_{\text{PS}} \) with 10 mV resolution. The good resolution permits to obtain accurate power measurements directly from the power supply.

To measure the main parameters of the converter the flow chart of Fig. 9 c) is presented which is divided in two steps

First step (step 1) measures the current \( I_{\text{PS1,i}} \) and the power \( P_{\text{PS1,i}} \) of each power supply with the resistors connected, the balancing system connected, but the balancing system switched off. During step 1 the power supply will only power the resistors.

During step 2 the balancing system is switched on. The voltage \( V_{\text{PS2,i}} \) and the current \( I_{\text{PS2,i}} \) of each power supply is measured. The power supplies continue to injecting the same power to the resistors, but the power losses of the converter are also supplied. The balancing system should give current to the less voltage resistor, decreasing the current contribution from the less voltage power supply, and increasing the current contributed from the high voltage power supplies.

During step 1 and step 2 the current fed to the resistor is equal because the voltage does not change. The change in the supply current is due to the balancing process of the balancing system. During step 1 \( I_{B,i} = 0 \), so the real balancing current \( I_{B,i} \) could be easily measured by the difference between the supply current in step 1 and the supply current in step 2.

\[
I_{B,i}^* = I_{\text{PS1,i}} - I_{\text{PS2,i}}
\]

The balancing power \( P_{B,i}^* \) is then defined by the balancing current and the power supply voltage, the total balancing power \( P_{\text{B,T}} \) is defined in the same way as in (28).

\[
P_{B,i}^* = V_{B,i} I_{B,i}^* = V_{\text{PS1,i}} I_{B,i}^* \quad P_{\text{B,T}}^* = \sum_{i=1}^{4} |P_{B,i}^*| \]

During step 1 the only power consumption are the \( R_{\text{supply}} \) resistors. When the active balancing converter is connected we have the \( R_{\text{supply}} \) losses and the total power loss of the converter \( P_{\text{Loss,T}} \). The power of step 2 minus the power of step 1 are the converter total power losses \( P_{\text{Loss,T}} \).

\[
P_{\text{Loss,T}} = \sum_{i=1}^{4} V_{\text{PS2,i}} I_{\text{PS2,i}} - \sum_{i=1}^{4} V_{\text{PS1,i}} I_{\text{PS1,i}}
\]

The efficiency of the balancing system \( \eta \) is them calculated as

\[
\eta = \frac{P_{\text{B,T}}^*}{P_{\text{B,T}}^* + P_{\text{Loss,T}}}
\]

Behavior under unbalancing situation

The first experimental step is to verify the correct behavior of the 6 single switch unbalancing systems under unbalancing situation. For that issue the test bench will be configured under two different unbalancing situations.

The first unbalancing situation will be a small unbalance between cells. The Weak cell simulated Power Supply will be established at \( V_{B,W} = 3.1 \) V and the Strong cell voltages to \( V_{B,S} = 3.2 \) V.

The second unbalancing situation will be a big unbalance. The Weak cell voltage is \( V_{B,W} = 2 \) V and the strong cell voltages will be established to the maximum cell voltages of the LiFePO4 cells \( V_{B,S} = 3.65 \) V.

Fig. 10 presents the balancing currents under different situation with the ideal design values under dashed lines (--) and
Fig. 11. Total real balancing power $P_{B,T}$ and power losses $P_{Loss,T}$ under a balanced situation with $V_{B,W}=3.65$ V. Maximum power losses occur at maximum cell voltage. Efficiency $\eta$ is calculated under balanced situation equation presented in (30).

During small unbalance and big unbalance the Weak cell balancing current $I_{B,W}$ is always higher than the Strong cell balancing current $I_{B,S}$. A natural balancing process occurs between Strong cells and the Weak cell.

The non-selective FLY_4P4SS converter gives the smallest difference between the Weak cell balancing current and the Strong cell current. This topology will not be suitable when big balancing power is required to balance the cells in a short period of time.

The primary parallel connected FLY_4P4SP gives big balancing current under big unbalancing situations Fig. 10 b), however in small unbalancing conditions Fig. 10 a), the high power losses reduce the balancing power of the converter.

Behavior under balanced situation

During balanced situation the power losses and the balancing power are nearly equal as presented in (30).

The balanced situation is generated with $V_{B,i}=3.65$ V to generate the maximum power losses.

Fig. 11 presents the difference between the real balancing power $P_{B,T}$ and the total power losses $P_{Loss,T}$. It is demonstrated that the balancing power only exchanges power to meet the power losses requirement.

Regarding to (33) is clearly seen that the efficiency $\eta$ is nearly 0. Little differences appear in the FLY_4P4SP and the Isolated_CUK due to non-idealities, but they have not big impact.

Model and experimental comparison

Fig. 12. Total balancing power $P_{B,T}$ and power losses $P_{Loss,T}$ comparison for each balancing system. Bar n°1 ideal balancing model. Bar n°2 power losses model. Bar n°3 real experimental results. Red bar: Power losses $P_{Loss,T}$ and blue Bar total balancing power $P_{B,T}$

Experimental results and model equations are going to be compared under an unbalancing situation. Main parameters and results are resumed in Table III.

The unbalancing is performed between a Weak cell voltage $V_{B,W}=2$ V and the strong cell voltages $V_{B,S}=3.65$ V.

First the power losses $P_{Loss,T}$ and the total balancing power $P_{B,T}$ will be compared between the ideal modelling, the modelling with the power losses taken into account and the real experimental results.

Fig. 15 presents the comparison between the ideal balancing design (Bar n°1), the parasitic modelled design (Bar n°2) and the real experimental results (Bar n°3). The red part of the bar are the power losses $P_{Loss,T}$ and the blue part is the total balancing power $P_{B,T}$.

The ideal balancing model represented in the first Bar (Bar n°1) injects the maximum energy to the system, without any power loss.

The power losses model presented in section III and represented in Fig. 12 by Bar n°2, give the new balancing power $P_{B,T}$ when the power losses of the converter are taken into account.

Bar n°3 of Fig. 12 give the power measurements made by the direct measurements of the power supply.

Good accuracy between real results and power losses is expected, knowing that power losses measurement in low power devices and high switching frequency devices is a difficult job.

The efficiency $\eta$ decreases respected to the 100 % ideal efficiency. A good approach between experimental and modelled is obtained thanks to the RMS calculations of DCM currents.

For the selective balancing systems is kept around 75 %Fig. 13.
The biggest the unbalancing is, the higher the efficiency reached by the balancing system. The non-selective balancing system FLY_4P4SS has the lowest efficiency nearly 50% because produces high power losses due to the current flow to all the series connected cells. The efficiency is low even if the balancing current of the system is the lowest. With the power losses modelling and the efficiency calculation a new estimation of the real balancing current $I_{B,W}$ could be made. The power losses are subtracted to the Weak cell (31) except for the non-selective FLY_4P4SS converter that are redistributed inversely proportional to the voltage as presented in (32).

The balancing current is reduced due to the power losses of the converter Fig. 14. The modelled Weak cell balancing current $I^*_{B,W,Model}$ permits to evaluate the real balancing current, with good accuracy.

### II. CONCLUSIONS

During this present work main single switch active balancing topologies have been analyzed, modelled and tested. Single switch active balancing systems present high simplicity due to a unique active device is used. They also have the natural behavior to balance series connected cells with an open loop control strategy. For that issue, DCM mode must be guaranteed during all the working points.

During Section II the ideal balancing behavior and equations are presented for the 6 most representative single switch balancing systems. The ideal modelling is focused on the energy transfer between the Strong cells and the Weak cell of a series connected energy storage system. The maximum critical duty cycle equation $D_{cr}$ is defined, and the balancing currents of the Weak cell $I_{B,W}$ and the strong cells $I_{B,S}$ are defined. The ideal modelling equations give the main parameters for the design of a single switch active balancing system because the energy transfer between the Weak cells and the Strong cells is defined.

Section III presents the power loss modelling of the single switch balancing systems. The power losses $P_{Loss,T}$ of the converters are taken into account to measure the power reduction of the converter. Due to DCM operation the RMS and AV currents of all the components should be modelled to correctly estimate the power losses $P_{Loss,T}$. This approach gives a most accurate model of the balancing currents $I^*_{B,W}$ and the converter balancing power $P^*_{B,T}$.

For the experimental results presented in Section IV the 6 different balancing systems have been designed and constructed to compare different behaviors under unbalanced and balanced situations. A power supply based test bench has been designed to simulate series connected cells unbalances and measure the power losses $P_{Loss}$ and balancing power $P_{B,T}$ indirectly by the power supply measurements. During unbalancing situation it has been seen that the Weak cell balancing current $I^*_{B,W}$ is always bigger that the Strong cells balancing current $I^*_{B,S}$. During balanced situation it has been demonstrated that the balancing power of the system only contributes energy to compensate the power losses of the system. No energy is exchanged between the cells. Ideal, modelled and experimental results are compared to evaluate the accuracy of the modelling and main conclusions are obtained.

The balancing system efficiency $\eta$ for a big unbalance case is kept above 75%. It is a high efficiency for systems which manage only 2 Watts of balancing power.

The non-selective FLY_4P4SS is the lowest efficiency system, and is not selective, decreasing the balancing speed of the system. This topology is the worst located for future balancing system designs.

Between the selective topologies, the efficiencies are similar and the behavior is similar. The FLY_4P4SP with the primaries in parallel has the worst behavior when a small balance is produced, due to higher power losses.

The Isolated_CUK will be a good balancing system candidate when high numbers of cells are connected in series. When high number of cells are connected in series the $D_{cr}$ could be very small, and the degree of freedom of the transformer ratio gives flexibility in the value of the duty cycle. This also happens in the different flyback topologies.

### Futurework

Future work will be held by testing the balancing systems in real battery pack tests. The main results of the energy increase and voltage balancing effect will be presented in future publications.
Appendix
The Appendix presents main single switch topologies current waveforms for two different unbalancing situations for a 4S1P battery back. The unbalancing effect will be analyzed by inserting a weak cell in the bottom cell or first cell (Scenario 1) or in the second cell (Scenario 2).

During Appendix it will be presented that is independent that the Weak cell is in the bottom or in the top part of the series connected cells.

The characteristics balancing currents presented in Fig. 15 are presented with the prototype parameters presented in Table II. The DCM operation is guaranteed for both unbalancing scenarios presented in Table IV. This case is guaranteed because \( D = 0.13 \), the critical duty cycle for a balancing situation of \( V_{B, W} = 2 \text{ V} \) and \( V_{B, S} = 3.65 \text{ V} \).

Non-selective behavior of the \( \text{FLY}_4\text{P4SS} \) balancing system is clearly observed. During \( T_{OFF1} \) period the balancing current flows to all the cells, not only to the Weak cell.

The \( \text{FLY}_1\text{P4S} \) and the \( \text{FLY}_4\text{P4SP} \) are selective topologies as could be seen in Fig. 15. It is also presented the higher peak current managed by the \( \text{FLY}_4\text{P4SP} \) due to the parallel operation of the balancing system.

The buck-boost based topologies have different behavior regarding current ripple depending the situation of the cell in the series connected string.

The \( \text{SEPIC} \) topology has bigger current ripple in the bottom cell (cell 1), the \( \text{ZETA} \) configuration in the top cell (cell 4) and the \( \text{Isolated_CUK} \) in the bottom cell (cell 1). Even the current ripple is different the mean current introduced to all the strong cells is equal.

The Weak cell mean current is always bigger than the Strong cells mean current.

The \( T_{OFF1} \) period depends directly in the Weak cell voltage, except for the non-selective \( \text{FLY}_4\text{P4SS} \), were the biggest \( T_{OFF1} \) period is the Weak cell voltage current but the other cells have different \( T_{OFF1} \) periods depending on their voltages.

45. Table IV
46. Different unbalancing scenarios For single switch balancing system current analysis

<table>
<thead>
<tr>
<th>Scenario</th>
<th>47. ( V_{B,1} )</th>
<th>48. ( V_{B,2} )</th>
<th>49. ( V_{B,3} )</th>
<th>50. ( V_{B,4} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
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<tr>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
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</tbody>
</table>

Fig. 15. Single switch balancing current waveforms. Vertical Axis: Balancing currents \( I_{B,i} \) [A]. Letter index: a) Scenario 1, b) Scenario 2. Number index: 1) \( \text{FLY}_1\text{P4S} \) 2) \( \text{FLY}_4\text{P4SP} \) 3) \( \text{FLY}_4\text{P4SS} \) 4) \( \text{SEPIC} \) 5) \( \text{ZETA} \), 6) \( \text{Isolated_CUK} \).
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Comparative Study and Evaluation of Passive Balancing Against Single Switch Active Balancing Systems for Energy Storage Systems

I. Aizpuru, U. Iraola, J.M. Canales, A. Goikoetxea, E. Garayalde

Abstract—Series connection of energy storage cells implies the need of a BMS and a balancing system to control and improve the performance of the battery pack. Nowadays passive balancing is the most used balancing system in industrial applications, basically due to its simplicity and low price. Active balancing systems are mostly reserved to research articles and experimental prototypes. During this research article, single switch active balancing systems will be presented as a real option of passive balancing substitution. For that purpose during the article most important characteristics of balancing systems will be presented regarding to the impact on the final battery performance, behavior and price. After detecting most important comparison characteristics single switch active balancing systems will be compared with a passive balancing system prototypes under different working situations.

Index Terms—Active balancing systems, Battery management systems, Energy conversion, Energy efficiency, Energy storage.

NOMENCLATURE

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$W_D$</td>
<td>Total useful discharged energy [Wh]</td>
</tr>
<tr>
<td>$W_{D,BAT}$</td>
<td>Total discharged energy [Wh]</td>
</tr>
<tr>
<td>$W_C$</td>
<td>Total charged energy [Wh]</td>
</tr>
<tr>
<td>$W_{C,BAT}$</td>
<td>Total useful charged energy [Wh]</td>
</tr>
<tr>
<td>$\eta$</td>
<td>Energy efficiency of the battery pack [%]</td>
</tr>
<tr>
<td>$W_{SB}$</td>
<td>Standby energy consumption [Wh]</td>
</tr>
<tr>
<td>$\Delta T$</td>
<td>Battery gradient between cells inside the battery pack[°C]</td>
</tr>
<tr>
<td>$T_{Max}$</td>
<td>Maximum temperature of the battery pack [°C]</td>
</tr>
<tr>
<td>$T_{BS}$</td>
<td>Generated temperature in the balancing system [°C]</td>
</tr>
<tr>
<td>$C_F$</td>
<td>Balancing system cost [€]</td>
</tr>
<tr>
<td>$P_{L,n}$</td>
<td>Power losses of the n cell [W]</td>
</tr>
<tr>
<td>$P_{L,BS}$</td>
<td>Power losses of the balancing system [W]</td>
</tr>
<tr>
<td>$I_{BAT}$</td>
<td>Battery pack current [A]</td>
</tr>
<tr>
<td>$I_{C,n}$</td>
<td>Single cell current [A]</td>
</tr>
<tr>
<td>$I_{B,n}$</td>
<td>Single cell balancing current [A]</td>
</tr>
<tr>
<td>$PB$</td>
<td>Passive Balancing</td>
</tr>
<tr>
<td>$AB$</td>
<td>Active Balancing</td>
</tr>
<tr>
<td>$HPF$</td>
<td>High power fresh cells</td>
</tr>
<tr>
<td>$HPA$</td>
<td>High power aged cells</td>
</tr>
<tr>
<td>$LPF$</td>
<td>Low power fresh cells</td>
</tr>
</tbody>
</table>

ENERGY storage applications are high demand and popular applications specially in portable technologies. One single cell is used in mobile phone applications and low number of series connected cells (3-4 cells) in laptops and other small portable devices.

High number of cells connected in series/parallel configuration are necessary for renewable energy and electromobility applications. Energy storage systems permit to increase the impact and penetration of renewable energy in the electric grid [1]–[6] and are the key factor for future success of the electric vehicles [7]–[9].

High power applications require series connection of the cells to obtain high voltage working voltages reducing the power losses due to joule effect losses. Series connection of cells decreases the total energy of the battery pack and reduces the performance of the system [10], [11]. The performance reduction is due to little manufacturing and environment differences that induce a mismatching between single cells characteristics as SOC, capacity and internal resistance differences [12]–[15].

In order to improve the available battery pack energy and performance, a balancing system is connected to the Battery Pack to reduce the differences and mismatch effect of series connected cells [16].

Energy storage balancing systems are divided in passive balancing systems and active balancing systems[17]–[19]. The main difference between both topologies is that passive balancing systems balance the series connected cells burning the extra energy of the most charged cells and the active balancing systems redistribute the energy of the strong cells to the weak cells. Passive balancing systems are widely used in industry applications due to simplicity, reliability and low cost characteristics.

Single switch active balancing systems present good characteristics as low complexity, low component number and the ability to balance the series connected cells without in open loop control mode [20], [21].

The main goal of this article is to compare passive and
single switch active balancing systems behavior under different conditions. 3 main comparison topics are evaluated:

- **Energy considerations:** Charging energy $W_C$, discharging energy $W_D$, efficiency $\eta$ and standby energy consumption $W_S$.
- **Temperature behavior:** Temperature gradient $\Delta T$ between series connected cells, maximum temperature of cells $T_{Max}$ and temperature and losses generated in the balancing system $T_{BS}$.
- **Cost:** The total cost of the balancing system is evaluated $C_e$.

Even though passive balancing systems are the most used and popular balancing systems in industrial and commercial applications, this paper will demonstrate the performance improvement of single switch active balancing systems, and will give the industry an interesting point of view of the benefits of active balancing vs. passive balancing systems, not only in terms of behavior, but also in terms of simplicity and cost.

The paper starts with a comparative evaluation between the topologies under study in section II. During section III, the main characteristics under study will be presented under a theoretical point of view. Section IV presents the experimental results of the balancing systems, and the comparison of their behavior. Last section presents the most important conclusions about the behavior and characteristics of the balancing systems.

### Table I

**ADVANTAGES AND DISADVANTAGES OF PASSIVE BALANCING SYSTEMS AND SEPIC BASED SINGLE SWITCH ACTIVE BALANCING SYSTEMS FROM LITERATURE KNOWLEDGE**

<table>
<thead>
<tr>
<th>Passive balancing system</th>
<th>Sepic single switch active balancing system</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td><strong>Advantages</strong></td>
</tr>
<tr>
<td>Simple.</td>
<td>Simple.</td>
</tr>
<tr>
<td>Cost.</td>
<td>Efficient.</td>
</tr>
<tr>
<td>Useless in discharge.</td>
<td>Open loop balancing.</td>
</tr>
<tr>
<td>Energy wasting.</td>
<td>Only voltage balancing.</td>
</tr>
</tbody>
</table>

### Table II

**WEAK CELL $I_{B,W}$ BALANCING CURRENT AND STRONG CELL $I_{B,S}$ BALANCING CURRENT OF BALANCING SYSTEMS UNDER STUDY, 4S1P BATTERY PACK N=4, ONE WEAK CELL $V_{B,W}=2V$ AND 3 STRONG CELLS $V_{B,S}=3.65V$**

<table>
<thead>
<tr>
<th>$I_{B,w}$ [mA]</th>
<th>$I_{B,S}$ [mA]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-304</td>
</tr>
<tr>
<td>365</td>
<td>-67</td>
</tr>
</tbody>
</table>
Seipc based single switch balancing currents depend directly in the duty cycle of the active switch, the converter inductors \( L_{in}, L_n \) and the difference between the voltage of the weak cell \( V_{B,W} \) and the whole battery pack \( V_{PACK} \). The bigger the difference between strong cells and weak cell voltages, the greater the balancing capacity is. The series connected cells are voltage balanced with an open loop control with a fixed duty cycle ratio \( D \) of the active switch \( S_1 \).

\[
\begin{align*}
I_{B,S} &= -\frac{V_{PACK}D^2T_s( L_n + nL_{in} )}{2L_{in}} \\
I_{B,W} &= \frac{V_{PACK}D^2T_s( L_n + nL_{in} )}{2L_{n}L_{in}} \left( \frac{V_{PACK}}{V_{B,W}} - 1 \right)
\end{align*}
\]

The balancing current values for the passive balancing system \( PB \) and the Sepic based active balancing system \( AB \) for 4S1P unbalanced battery packs are presented in Table II.

The passive balancing system has a power resistor \( R_p \) of 12 \( \Omega \). The active balancing system \( AB \) switches with a constant \( D \) of 13\% with a switching frequency of 100 kHz. The inductors are designed for a value of \( L_{in} = 470 \mu H \) and \( L_n = 68 \mu H \). Both balancing systems are of similar characteristics (Table II presents current rate of both systems in an unbalanced situation) to obtain comparable data.

**IMPACT CHARACTERISTICS OF BALANCING SYSTEMS**

Balancing systems are connected to energy storage systems with the main target of improving battery pack characteristics. The effect of the balancing system can be presented in improvements of power and energy specifications, energy efficiency of the system and extension of the cycle life.

**A. Energy considerations**

The energy evaluation of the battery pack is usually evaluated under two different criteria, considering cycle life and calendar life issues.

Cycle life issues will be related to the energy inserted to the battery pack during a charging process \( W_C \) (considered positive), the energy obtained during discharge \( W_D \) (considered negative) and the efficiency of the battery pack with respect to the energy inserted and the energy discharged \( \eta \).

Charging energy \( W_C \) is the total energy inserted from the point of view of a battery charger. The total energy inserted to the battery pack \( W_{C,BAT} \) is measured by the integration of the voltage \( V_{B,B} \) and the current \( I_{C,B} \) of each cell. It is also the total energy measured by the charger \( W_C \) subtracting the energy lost by the power losses of the balancing system \( P_{LBS} \).

\[
\begin{align*}
W_C &= \int V_{B,B}(t)I_{C,B}(t)dt \\
W_{C,BAT} &= \int V_{B,B}(t)I_{C,B}(t)dt = W_C - \int P_{LBS}(t)dt
\end{align*}
\]

During the discharge process, active balancing redistributes energy to the weak cell improving the total discharge energy \( W_D \) by increasing the weak cell current \( I_{C,W} \). As during charge, the battery discharged energy \( W_{D,BAT} \) is reduced due to power losses of the balancing system \( P_{LBS} \). The term reduced means that it is more negative.

\[
\begin{align*}
W_D &= \int V_{B,B}(t)I_{C,W}(t)dt \\
W_{D,BAT} &= \int V_{B,B}(t)I_{C,W}(t)dt = W_D - \int P_{LBS}(t)dt
\end{align*}
\]

The efficiency \( \eta \) of the battery pack is the ratio between the energy inserted and the energy obtained from a battery pack.

\[
\eta = \left| \frac{W_D}{W_C} \right| \times 100
\]

This ratio defines the performance of the battery pack and the behavior due to the balancing system.

Calendar life behavior of the battery pack is represented by the aging process due to battery pack time degradation. For this issue the self-discharge current of the battery pack will be measured due to stand by energy discharge \( W_{SB} \). The effect of the balancing system during the stand-by process should be analyzed to estimate their influence in the calendar life process.
B. Temperature behavior

The balancing system influences in the temperature behaviour of the battery pack, in parameters as the maximum temperature $T_{Max}$ and the deviation in temperature $ΔT$ between different cells of the battery pack [22]. The power losses of the balancing system also increase the temperature of the balancing system board $T_{BS}$ that could generate a hot spot for nearby positions cells.

$T_{Max}$ and $ΔT$ of the single cells composing a battery pack are directly dependent on the power losses of each single cell. The power losses of each cell are proportional to the internal resistance of the cell $R_n$ and increase quadratically due to cell current $I_{C,n}$. The internal resistance could also be approached to the difference between the cell voltage $V_B$ and the open circuit voltage $V_{OC}$:

$$P_{L,n} = R_n I_{C,n}^2 ≈ V_{B,n}^2 - V_{OC} | I_{C,n}$$  \hspace{1cm} (9)

Balancing systems equalize the voltage level of each cell, so they improve the temperature gradient between cells $ΔT$ respect to no balancing systems, assuming equal aging of cells.

Maximum temperature $T_{Max}$ is improved in series connected cells thanks to active balancing systems during discharge processes. Passive balancing systems do not deliver any balancing current to the weak cell, however active balancing systems insert current to the weak cell decreasing the total current that flows through the cell during discharge.

$$P_{L,W} = R_n I_{C,W}^2 = R_n (I_{BAT} + I_{B,W})^2 \quad AB \quad P_{L,W} \downarrow \downarrow$$

$$P_{L,W} = R_n I_{C,W}^2 = R_n I_{B,W}^2 \quad PB \quad P_{L,W} ≈ cte$$  \hspace{1cm} (10)

During charge both passive and active balancing systems decrease the maximum temperature of the cell due to decrease in current of the strong cell $I_{C,S}$.

$$P_{L,S} = R_n I_{C,S}^2 = R_n (I_{BAT} + I_{B,S})^2 \quad PB, AB \quad P_{L,S} \downarrow \downarrow$$  \hspace{1cm} (11)

High temperatures in the balancing system $T_{BS}$ could induce a mismatch in the temperature of different cells of a battery pack due to heat concentration next to the balancing system. Passive balancing systems burn all the energy in the balancing resistor, while active balancing systems only generate heat due to power losses in the balancing converter. Passive balancing systems can generate a hot spot in the battery pack.

C. Cost

Balancing system cost is one of the most important parameters, if not the most important one, why passive balancing is the principal balancing architecture in industrial applications.

Active balancing systems usually are complex architectures requiring several active switches. Each active switch requires a high frequency isolated driver increasing the cost, and decreasing the reliability of the whole system.

Passive balancing systems typical architecture presented in Fig. 1 a) require an optocoupler $OP_n$ to isolate the system and a power switch $S_n$ in conjunction with a balancing resistor $R_{B,n}$ to discharge the excess energy of the cells. The voltage measurement of each cell is made via differential amplifiers $D_n$, for voltage balancing control, even if specific ICs for BMS operation have decreased the complexity and the price of passive balancing systems.

Single switch balancing topologies, as the Sepic architecture presented in Fig. 1 b) only need one single switch to balance one series string of cells. Voltage measurement is not necessary as the balancing process is made naturally and the switching of the active switch is made in open loop, decreasing the complexity of the driver and the control system.

The specifications of single switch open loop systems could be a key point as the main architecture to change the industry position from passive configurations to active balancing systems.

EXPERIMENTAL RESULTS AND COMPARISON

The evaluation and comparison of passive and active balancing systems is made under 3 different environments. The comparative evaluation is made for a 4S1P battery pack with the PB and AB systems presented in section II. The comparative results are presented in Fig. 4.

- **High power fresh cells (HPF):** a 4S1P battery pack of 6.5 Ah LiFePO₄ fresh cells has been connected to prove the balancing systems behavior under a newly assembled battery pack.
- **High power aged cells (HPA):** An 80% SOH 6.5Ah nominal capacity LiFePO₄ cell has been connected with 3 fresh cells making a 4S1P battery pack with one cell in an advanced aging stage.
- **Low power fresh cells (LPF):** A 4S1P battery pack of 1.1 Ah low capacity LiFePO₄ cells has been implemented to view the effect in lower capacity cells, where the balancing current $I_{B,n}$ is closer to the nominal
BATTERY PACK WITHOUT BALANCING

connected. The AB power losses are measured experimentally.

due to balancing systems a charge storage time a full discharge of the battery pack is evaluated, and the discharged energy increased $W_D$ is increased 0.07 Wh in AB system.

The $AB$ system charges less energy in the battery pack and discharges more energy being superior than the PB system.

Due to the excessive energy wasted, during charge and discharge process in PB, the battery pack efficiency is greatly improved with the $AB$ system, 6,02% for HPA cells and 1,79% for LPF cells. The $AB$ system is much superior than the PB system in efficiency requirements. For continuous charge discharge applications as electro mobility, the efficiency requirement is primordial.

For standby energy consumption $W_{SB}$, 4S1P battery pack has been stored fully charged at 25 °C ambient temperature, during the standby period $PB$ and $AB$ balancing systems have been connected to evaluate the leakage current of the balancing systems. The balancing systems have been connected during 3 weeks consecutive periods. After the storage time a full discharge of the battery pack is evaluated, with 1C constant current, to compare the energy decrease with a non-balancing system battery pack.

The results presented in Table IV conclude that the balancing system do not contribute in an accelerated self-discharge process of the battery pack. The PB system increases the self-discharge only 0.22% and the $AB$ system 0.1% respect to a 4S1P battery pack without balancing system.

E. Temperature behavior

To compare the temperature improvement and behavior of the 4S1P battery packs due to balancing systems, 2 K type thermocouples have been connected to each cell to evaluate the maximum temperature $T_{max}$ in the surface and the temperature distribution $\Delta T$ between the 4S1P cells.

In order to avoid temperature influence between nearby positioned cells, the cells are distanced 2 cm between them.

D. Energy considerations

In order to evaluate energy characteristics related to cycle life and cycling behavior due to balancing systems a charge discharge cycle has been designed.

- **Charge cycle:** A 1CConstant Current CC until $V_{B,n}=3.65$ Constant Voltage CV until $I_{BAT}=C/20$ charge cycle has been defined to evaluate charging energy $W_C$.

- **Discharge cycle:** A 1CCC discharge cycle until $V_{B,n}=2V$ is designed to evaluate the total discharge energy $W_D$.

Both cycles are repeated 10 times to evaluate the balancing system performance during repetitive cycling. The balancing systems are controlled by voltage difference. The threshold voltage for balancing switching on is set to 10 mV difference between two cells. The 4S1P battery packs are cycled inside a temperature chamber with a constant 25°C ambient temperature.

During the charge process passive balancing consumes more energy from the charger to charge the battery pack. Even if energy excess consumption, the battery pack is more charged with $PB$ than with the $AB$. However the charging efficiency is much lower in the $PB$ system than in the $AB$ due to higher power losses of the $PB$. The power losses in the $PB$ system are easily calculated knowing the balancing resistor $R_{B,n}$, the cell voltage $V_{B,n}$ and the balancing time when $PB$ is connected. The $AB$ power losses are measured experimentally as 0.195 W for an unbalance situation of 2 V for the weak cell $V_{B,W}$ and 3.65 V for the strong cells (presented in Fig. 5). When $AB$ is active constant 0.195 W power losses are considered, even the real losses will be smaller. However, even if the power losses are overestimated the $AB$ power losses are much lower than the $PB$ system power losses.

Discharge process is greatly improved by the $AB$. The passive balancing only burns energy in order to decrease the voltage difference between cells reducing the total energy of the battery pack. The $AB$ redistributes the energy to the lowest voltage cell, increasing the discharge time and the total discharge energy. The power losses during discharge are higher in $PB$ than in $AB$.

The cycling results presented in Table III, conclude that -92.48 Wh are discharged $W_D$ with the $PB$ system, 0,2Wh less than with the $AB$ system although 97.89 Wh are charged, 0,93 Wh more than with the $AB$ for HPF cells.

The results with HPA cells are even better for the $AB$ system. $W_C=70.68$ Wh are charged with the $PB$ system, 3.72 Wh more than with the $AB$ system. However the $AB$ system discharges $W_D=-63.95$ Wh 0.6 Wh more than the $PB$ system.

The results for the LPF cells are also superior for $AB$ system compared with $PB$ system. The charged energy $W_C$ is decreased 0.19 Wh for the $AB$ system, and the discharged energy increased $W_D$ is increased 0.07 Wh in AB system.

Due to the excessive energy wasted, during charge and discharge process in $PB$, the battery pack efficiency is greatly improved with the $AB$ system, 6,02% for HPA cells and 1,79% for LPF cells. The $AB$ system is much superior than the $PB$ system in efficiency requirements. For continuous charge discharge applications as electro mobility, the efficiency requirement is primordial.

For standby energy consumption $W_{SB}$, 4S1P battery pack has been stored fully charged at 25 °C ambient temperature, during the standby period $PB$ and $AB$ balancing systems have been connected to evaluate the leakage current of the balancing systems. The balancing systems have been connected during 3 weeks consecutive periods. After the storage time a full discharge of the battery pack is evaluated, with 1C constant current, to compare the energy decrease with a non-balancing system battery pack.

The results presented in Table IV conclude that the balancing system do not contribute in an accelerated self-discharge process of the battery pack. The PB system increases the self-discharge only 0.22% and the AB system 0.1% respect to a 4S1P battery pack without balancing system.

### Table III

**TOTAL CHARGE, DISCHARGE AND EFFICIENCY BEHAVIOR OF 3 DIFFERENT 4S1P BATTERY PACKS UNDER CCCV CHARGE AND CC DISCHARGE PROCESSES.**

<table>
<thead>
<tr>
<th></th>
<th>HPF</th>
<th>HPA</th>
<th>LPF</th>
</tr>
</thead>
<tbody>
<tr>
<td>$W_C$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$W_{C,D}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$W_D$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$W_{D,D}$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\eta$</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\eta$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$W_C$</th>
<th>$W_{C,D}$</th>
<th>$W_D$</th>
<th>$W_{D,D}$</th>
<th>$\eta$</th>
<th>$\eta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$PB$</td>
<td>97.89</td>
<td>97.21</td>
<td>70.68</td>
<td>68.76</td>
<td>13.79</td>
<td>13.64</td>
</tr>
<tr>
<td>$AB$</td>
<td>96.96</td>
<td>96.9</td>
<td>66.96</td>
<td>66.64</td>
<td>13.60</td>
<td>13.53</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$W_C$</th>
<th>$W_{C,D}$</th>
<th>$W_D$</th>
<th>$W_{D,D}$</th>
<th>$\eta$</th>
<th>$\eta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$PB$</td>
<td>-92.28</td>
<td>-92.61</td>
<td>-63.25</td>
<td>-65.22</td>
<td>-12.59</td>
<td>-12.7</td>
</tr>
<tr>
<td>$AB$</td>
<td>-92.48</td>
<td>-92.5</td>
<td>-63.95</td>
<td>-64.02</td>
<td>-12.66</td>
<td>-12.69</td>
</tr>
</tbody>
</table>

### Table IV

**TOTAL DISCHARGED ENERGY $W_D$ AND ENERGY WASTED DURING STANDBY OPERATION $W_{SB}$ FOR A 4S1P LIFEP04 BATTERY PACK WITHOUT BALANCING SYSTEM, WITH $PB$ SYSTEM AND WITH $AB$ SYSTEM.**

<table>
<thead>
<tr>
<th></th>
<th>$W_D$</th>
<th>$W_{SB}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>No balancing</td>
<td>-91.33 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>$PB$</td>
<td>-91.13 (99.78%)</td>
<td>0.2 (0.22%)</td>
</tr>
<tr>
<td>$AB$</td>
<td>-91.24 (99.9%)</td>
<td>0.09 (0.1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>$\Delta T$</th>
<th>$T_{max}$</th>
<th>$T_{max}$</th>
<th>$T_{max}$</th>
<th>$\Delta T$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$PB$</td>
<td>28.61</td>
<td>0.4</td>
<td>29.59</td>
<td>2.07</td>
<td>27.86</td>
</tr>
<tr>
<td>$AB$</td>
<td>29.23</td>
<td>0.3</td>
<td>29.53</td>
<td>1.95</td>
<td>27.64</td>
</tr>
</tbody>
</table>

www.ijsrp.org
The maximum temperature $T_{\text{max}}$ and the maximum temperature gradient $\Delta T$, take place at the end of the discharge process. The temperature behavior has been evaluated during the cycles presented for the energy considerations during the previous subchapter. The temperature values are the mean value of the 10 consecutive discharge cycles. The mean value permits to filter temperature measurement errors and dispersion.

Table V presents the temperature behavior results for 10 consecutive charge discharge cycles. For HPF cells $PB$ reaches lower maximum temperature than $AB$. This result conflicts with equation (10). However the temperature increase in $AB$ could be generated due to a deeper SOC reached (Lower $V_{\text{OC}}$), and higher $R_{\text{in}}$ reached. The temperature dispersion between cells is reduced from 0.4 °C on the $PB$ to 0.3 °C on the $AB$.

The results for the HPA configuration present that the PB reaches higher temperature than AB, if an aged cell is presented in the battery module. The temperature dispersion increases more than 1.5 °C from the HPF case, so it is also concluded that low SOH dispersion cells have lower temperature dispersions. The temperature dispersion $\Delta T$ is 0.12°C lower for $AB$ than the 2.07 °C dispersion presented for the $PB$ system configuration.

For the LPF battery module configuration the $AB$ presents better characteristics regarding $T_{\text{max}}$ and $\Delta T$ compared to the $PB$ system. The balancing current rating of the $AB$ system is closer to the nominal capacity of the LPF configuration than for the HPF configuration, presenting better results than the $PB$ system for fresh cells. 0.22 °C less respect to $T_{\text{max}}$ and 0.05 °C less temperature dispersion $\Delta T$. The power losses $P_{\text{LBS}}$ of the balancing system could generate a temperature increase near the battery pack decreasing the life span of the battery by accelerating aging mechanisms. In order to evaluate the temperature generated in the balancing system $T_{\text{BS}}$ a test bench with 4 power supplies connected in series has been designed. The power supplies are bidirectional with power sinking capability. 3 power supplies connected in series are set to 3.65 V and the weak cell is simulated to 2V to evaluate the extreme unbalancing situation.

The temperature losses of the balancing circuits are experimentally measured and the temperature hot spots in the balancing system are measured by a thermography camera Fig. 5. The $AB$ system has a hot spot of 38.2 °C, with total power losses of 0.195 W. The hot spot is presented in the mosfet driver and in the diode which inserts energy in the simulated 2 V weak cell. The $PB$ system dissipates 3.5 W in 3 balancing resistors, generating 3 dangerous hot spots of 119.3 °C. The excess temperature in the $PB$ could increase the temperature of the battery pack significantly, or even could make a temperature unbalance between cells of a battery pack. The losses are independent of the battery pack cell, only depend on the battery pack cell voltage.

**Table VI**

<table>
<thead>
<tr>
<th>$PB$</th>
<th>$AB$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part ref.</td>
<td>€/pcs</td>
</tr>
<tr>
<td>$OP_s$</td>
<td>TLP523</td>
</tr>
<tr>
<td>$R_s$</td>
<td>ER7412RJT</td>
</tr>
<tr>
<td>$S_n$</td>
<td>BD437</td>
</tr>
<tr>
<td>$DA_s$</td>
<td>INA 148</td>
</tr>
</tbody>
</table>

Price of components for minimum order of 10 pieces in www.farnell.com

* Only one element per battery pack

Fig. 4. Spyder chart comparison for energy, temperature and cost characteristics of a passive balancing system and an active single switch Sepic balancing system. a) High Power Fresh cells HPF b) High Power Aged cells HPA c) Low power fresh cells LPF.
F. Cost

Cost issue is the biggest constraint, why PB is the most used balancing system and why is widely used in industry applications. However, single switch balancing systems are good candidates to deal with cost issues. A voltage measurement system is not required. Single switch systems operate in open loop, reducing the complexity of the control system.

To evaluate the cost of the PB and AB systems, the cost of each cell balancing unit will be evaluated, taking into account the price per each element.

- **PB**: Optocoupler $OP_n$, Balancing resistor $R_{B,n}$, power switch $S_n$, and differential amplifier $DA_n$ per each cell.
- **AB**: Diode $D_n$, inductor $L_n$ and capacitor $C_n$ per each cell, and one input inductor $L_{in}$ and one power switch $S_1$ per battery pack.

The results presented in Table VI present that the AB is cheaper 13.16 € than the PB, mainly due to the high price of differential amplifiers $DA_n, AB$ open loop control strategy avoids the use of a measurement system for each cell voltage, however due to the natural unsafe behavior of Li-ion cells voltage monitoring is indispensable. If specific Battery Management System IC is used for PB systems the PB cost could be reduced.

CONCLUSIONS

A comparative study has been presented where a single switch Multi stacked Sepic active balancing system has been compared with a passive balancing system. Single switch active balancing systems are a good candidate to substitute passive balancing due to low complexity and open loop control in DCM.

The main conclusion claims that active single switch active balancing are good candidates to replace passive balancing systems in industrial applications.

The passive balancing system and the active balancing system are compared in 3 different scenarios with high power fresh cells, high power aged cells and low power fresh cell in a 4S1P configuration. The 3 different configurations are compared for energetic considerations temperature behavior and cost issues.

Regarding to energetic results, active balancing is much superior to the passive balancing system. Inserts less energy from the battery charger (reducing the electric bill), and increases the discharged energy (increasing battery energetic availability). The efficiency of the battery pack is greatly increased. 1% for high power fresh cells, 6% for high power aged cells and nearly 2% for low power fresh cells. Active balancing and passive balancing systems connection to a battery pack do not affect in self-discharge increase.

Temperature behavior results present a better behavior of the passive balancing system only regarding maximum temperature in high power fresh cells. Maximum temperature in aged and low power cells is reduced in active balancing system respect to passive balancing system. The temperature dispersion between cells is always lower in the active balancing system than in the tested passive balancing system. The balancing system temperature is dramatically reduced from 119.3 ºC in the passive balancing system to 38.2 ºC in the active balancing system, reducing the possibility of generating hot spots inside the battery pack.

The cost issue presents a lower cost for the active balancing system 13.16 € than for the passive balancing system 18.852. This is because single switch balancing systems can balance the cells without the need of a voltage measurement system. However the natural unsafety behavior of Li-ion cells forces to use a voltage monitoring system. Passive balancing system price could also be reduced by the use of commercial ICs for battery management systems.

REFERENCES


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RETROFITTING OF R.C SQUARE COLUMNS BY MICRO-CONCRETING AND CFRP CONFINEMENT- AN EXPERIMENTAL STUDY

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Abstract- There is different techniques to increase existing column capacities; however, such techniques differ in their advantages and disadvantages. In this research work, it is intended to study the effectiveness of an alternative technique involving micro-concreting (around square specimen to obtain circular) for increasing existing column capacity without much increase in section dimensions under axial compressive load using 200 T compression testing machine. The objectives of this research are to understand the behavior of R.C square, R.C square micro-concreted to circular (SMC) & R.C integral circular specimens subjected to axial compression & to compare the effect of CFRP confinement on the above three types of column specimens by means of an experimental investigation. Totally, 16 short reinforced concrete column specimens, 10 unconfined and 6 confined, subjected to axial compressive loading were considered for the experimental study. Here SMC represents specimens obtained using modified method of retrofitting the square columns by micro concreting. It is confirmed that confinement by CFRP is an effective method of retrofitting for enhancement of ultimate load carrying capacity & ductility of column and concluded that the degree of enhancement of ultimate axial load carrying capacity due to CFRP confinement of SMC specimens & integral circular specimens is more than that of similar confinement of R.C square column specimens. Performance (in terms of ultimate axial load, & ultimate axial strain) of CFRP confined reinforced SMC specimen is better than corresponding R.C square column specimen & is equal to that of equivalent integral circular column specimen.

Index Terms- RC Square column, R.C square micro-concreted to circular (SMC), CFRP, Ductility.

I. INTRODUCTION

Natural disasters such as hurricanes, tornadoses, tsunamis, and earthquakes and accidental impacts can damage or make structures in-deficient in a matter of seconds. On the other hand, saltwater, de-icing chemicals, and freeze-thaw cycles can cause structural deterioration over a longer period of time. The majority of older buildings and bridges were constructed according to older design codes. These structures are vulnerable during extreme events and need to be retrofitted to meet the current codes and standards. Advanced composite materials are generally used in the industrial fields like aerospace, marine and automotive industries due to their excellent engineering properties such as high strength, high stiffness, high durability, low density, high fatigue endurance, low thermal coefficient, corrosion resistance and good strength-to-weight ratio (Pendhari et al., 2008). Understanding of the CFRP-confining effectiveness in different cross sections of concrete column is essential to the proper strengthening of RC columns through the wrapping of FRP sheets. The use of confinement increases the lateral pressure on the member which results in more ductility and higher load capacity. Confinement is less effective for rectangular and square than circular shape RC columns due to the confining stresses that are transmitted to the concrete at the four corners of the cross-section. This phenomenon is presented in Figure1.1, where confinement effectiveness is shown as grey shaded area for various column shapes. Confinement effectiveness improves with the increase in the corner radius.

Fig 1.1: Effective confinement areas in circular, square and rectangular columns.

It is seen that even after rounding of the corners of the jacketed square columns the enhanced compressive strength of jacketed square columns is limited compared to the jacketed circular specimens (Stephen Pessiki et al 2001). So a modified technique for effective FRP confinement of square/rectangular columns was used. In this technique, the square columns are modified into circular columns by micro-concreting (without rounding off the columns) such that the diameter of circular column is equal to the diagonal of the original square column, followed by external wrapping with FRP fabric so as to obtain high compressive strength. It was shown that for R.C square concrete column specimens, this technique resulted in ultimate load carrying capacity higher than that of FRP jacketed square columns (with round corners) and nearly equal to that of the FRP jacketed circular specimens of same radius. In the above scheme, as the circular edges replace the straight edges, unconfined concrete area as shown in Fig-1.2 is converted into effective confinement area.
Hence there will be uniformity of confinement in modified square sections and hence the concrete area can be effectively utilized in confinement. Effectiveness of the above technique for R.C square specimen is investigated in the present study and such column specimens are termed as SMC (Square Micro-concreted to Circular) specimens.

II. LITERATURE REVIEW

Lei-Ming Wang, Yu-Fei Wu (2008) undertook compressive testing to investigate the effect of corner radius on the strength and ductility of FRP-confined concrete columns. A series of tests on 108 carbon FRP (CFRP) confined short concrete columns of dimensions 150 × 150 mm in cross section and 300 mm in height but with different corner radii were conducted. The primary variables in the investigation were the corner radius, transverse jacket stiffness (thickness of the CFRP), and concrete grade. The compression tests were conducted using a FORNEY testing machine with a maximum load capacity of 2500 kN. The test results demonstrated that the corner radius ratio is in direct proportion to the increase in confined concrete strength. Furthermore, it was revealed and explained that confinement provided by a jacket with sharp corners is insignificant in increasing the strength of columns but significant in increasing the ductility of columns. 

Abbas S. Al-Ameeri, et.al. (2013) In this work, the behavior of reinforced concrete columns under biaxial bending is studied. This work aims at studying the repairing of columns by using carbon fiber reinforced polymer (CFRP). The experimental work includes investigation of six reinforced concrete columns (150×150×500mm) tested under several load conditions. Variables considered in the test program include: effect of eccentricity and effect of repairing material (Epoxy and Sika repair). Test results are discussed based on load – lateral deflection behavior and ultimate load. The CFRP reinforcement enhances the behavior of damaged columns. Using of Epoxy material was more significant than effect of the Sika repair material.

Ahmed Shaban Abdel-Hay(2014) This study is carried out to investigate the overall behavior of R.C square columns with poor concrete at upper part, strengthened with CFRP. The wrapped part of column was the upper part only. An experimental program was undertaken testing ten square columns 200 · 200 · 2000 mm. One of them was a control specimen and the other nine specimens were strengthened with CFRP. The main parameters studied in this research were the compressive strength of the upper part, the height of the upper poor concrete part, and the height of CFRP wrapped part of column. The experimental results including mode of failure, ultimate load, concrete strain, and fiber strains were analyzed. The main conclusion of this research was, partial strengthening of square column using CFRP can be permitted and gives good results of the column carrying capacity.

III. PROPERTIES OF MATERIAL USED IN THE INVESTIGATION

3.1 Cement

The Cement used for casting of the concrete columns was chosen conforming to IS code which is local available. The properties of cement are given in table.1.

<table>
<thead>
<tr>
<th>Table 1. Physical Properties of Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
</tr>
<tr>
<td>Initial setting time</td>
</tr>
<tr>
<td>Final setting time</td>
</tr>
<tr>
<td>Compressive strength</td>
</tr>
</tbody>
</table>

3.2 Coarse Aggregate:

The coarse aggregate used is crushed stone of 12 mm down size. The laboratory analysis yielded the results of specific gravity and fineness modulus are 2.70 & 2.12 respectively.

- Fine Aggregate:
  Fine aggregate used in experimental programme Natural River sand collected from local source. The specific gravity of sand is 2.62. The fineness modulus of sand is 3.52 and its conforming to zone II grading of I.S 10262-1982.

- Micro-Concrete
  Micro-concrete is a dry ready mix cementitious based composition formulated for use in repairs of areas where the concrete is damaged & the area is restricted in movement making the placement of conventional concrete difficult. It is supplied as a ready to use dry powder which requires only addition of clean water at site to produce a free flowing non shrink repair micro concrete. Fig 3.1, shows the image of micro-concrete.

![Fig 3. 1 Image of Micro-concrete](image-url)
The properties of which as supplied by manufacture as follows:

<table>
<thead>
<tr>
<th>Table 2. Properties of Micro-Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect</td>
</tr>
<tr>
<td>Water/powder ratio, by weight</td>
</tr>
<tr>
<td>Fresh wet density</td>
</tr>
<tr>
<td>Compressive strength (ASTM C109, 7cm cube)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Flexural strength (ASTM C78)</td>
</tr>
<tr>
<td>Modulus of elasticity</td>
</tr>
</tbody>
</table>

- **CFRP**
  The properties of carbon FRP sheets, as listed in Table.3, were provided by a standard manufacturer and used for wrapping the column specimens. The fabric was unidirectional with non-structural weaves in the secondary direction to hold the fabric together. For each revolution of the FRP sheets, an overlap of 100 mm & 130 mm for square and circular column specimens respectively were used to ensure proper confinement and to avoid de-bonding of CFRP overlaps.

<table>
<thead>
<tr>
<th>Table 3. Property of CFRP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibre orientation</td>
</tr>
<tr>
<td>Modulus of elasticity</td>
</tr>
<tr>
<td>Tensile strength</td>
</tr>
<tr>
<td>Density of fibre</td>
</tr>
<tr>
<td>Ultimate elongation %</td>
</tr>
<tr>
<td>Thickness</td>
</tr>
</tbody>
</table>

- **Mix Proportions**
  Grade of concrete used for casting of columns was M15. By having the properties of cement and aggregates the mix design was carried out to calculate the quantities of materials and water-cement ratio to obtain strength of 23.6 N/mm² (target strength) as per I.S 10262-1982. The mix proportions selected out of trial mixes are given in table 4, corresponding to the average cube compressive strength of concrete at 28 days in the experimental study is equal to 25.6 n/mm².

- **Description of Test Specimens**
  - Unwrapped R.C square specimens, SR0
  - R.C square specimen wrapped with 1 layer of CFRP, SR1.
  - R.C square specimen wrapped with 2 layers of CFRP, SR2.
  - Unwrapped R.C square micro-concreted to circular specimen, SMC0.
  - R.C square micro-concreted to circular specimen wrapped with 1 layer of CFRP, SMC1
  - R.C square micro-concreted to circular specimen wrapped with 2 layers of CFRP, SMC2.
  - Unwrapped Reinforced equivalent circular specimens, CR0.
  - Reinforced equivalent circular specimens wrapped with 1 layer of CFRP, CR1.
  - Reinforced equivalent circular specimens wrapped with 2 layers of CFRP, CR2.

IV. **EXPERIMENTAL PROGRAMME**

- **Casting of Specimens and Curing**
  The constituent materials were measured in weighting machine in dry condition and fed into the concrete mixer by adding water content (admixture was mixed in water). The mix was then allowed to rotate for a period of 2 minutes. After ensuring uniform mixing, concrete was dumped and put into moulds. After placing the concrete into moulds, compaction was done thrice by vibrator to eliminate the voids. The specimens were de-moulded, numbered and transferred into fresh water tank for curing period of 28 days.

- **Micro-Concreting**
  This was required for SMC specimens
  - Surface Preparation For SMC Type Specimens Before Micro-Concreting.

After curing of square columns, appropriate shear keys were provided to bring about integral action between existing concrete and new micro-concrete. 10 mm diameter holes were drilled with the help of drilling machine by keeping staggered spacing equal to 150 mm and are separated by 35 mm horizontally as shown in the Fig.5.1 (a) and (b). For Shear keys mild steel bar of diameter 6 mm is used and bent into L shape, the dimensions of which are as shown in the Fig.5.1(c). Shear keys are anchored into holes by using a anchoring material which consists of two parts, filler and resin. Filler and resins were mixed thoroughly in 4:1 proportion. The grout should be poured steadily into the prepared dust free
holes. The anchor bar is then pressed into the hole to the required depth.

Table 4. Mix Proportions

<table>
<thead>
<tr>
<th>Materials</th>
<th>Cement (kg/m³)</th>
<th>Water (lts/m³)</th>
<th>F.A (kg/m³)</th>
<th>C.A (kg/m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity</td>
<td>250</td>
<td>145</td>
<td>839</td>
<td>1219</td>
</tr>
<tr>
<td>proportion</td>
<td>1</td>
<td>0.58</td>
<td>3.35</td>
<td>4.87</td>
</tr>
</tbody>
</table>

The external surface before applying epoxy bonding material, was hacked to obtain rough surface and was treated with epoxy bonding material for having better bond between old concrete and new micro-concrete then epoxy bonding material was applied as shown in Fig 5.2.

For each batch, 75 Kg of micro-concrete was weighed and placed in tilting drum mixer. The optimum water required for pourable concrete is 3.5 liter per 25 kg of micro-concrete. Water required for 75 kg is 10.5 Kg in which 80 % of water was added initially into the mixer by keeping the mixer running slowly. Process of mixing was continued for 3-4 minutes until a lump free mix is obtained. Remaining water was added while continuing the mixing until the desired consistence is achieved. The mixed micro-concrete was poured into form work until all the gaps were filled up and 3 cubes of 100 mm size were also cast for determination of compressive strength. Formwork was demoulded after 1 day. The specimens were left for curing for 7 days.

V. CFRP WRAPPING

5.3.1 Application of saturant and CFRP sheet.

On the next day, the two-part epoxy saturant was mixed thoroughly in accordance with the manufacturers specifications and a thin layer of it was applied to the surface of the specimen by using flexible Nylon brush as shown in Fig 5.3 (a). The CFRP sheet was then carefully wrapped around the specimen with the fibers oriented in the hoop direction, forming one or two layers of CFRP as show in Fig 5.3 (b).

- Capping of Test Specimens

In order to have uniform distribution of applied compressive stress, the end surfaces are made smooth, perfectly perpendicular to the longitudinal axis of the column and this process is called as capping. The capping is done using a cementitious grouting material which has a high compressive strength (55-65 MPa), so that it should not fail before the column.

Fig 5.2 Capping of Column Specimens

All specimens were mounted in a Compressive Testing Machine of 200 T capacities as shown in Fig 4.15 (a) & (b) and loaded under a monotonic uni-axial compression load upto failure.
VI. RESULTS AND DISCUSSIONS

The results presented in the form of tables (table 5.1, table 5.2 & table 5.3) & graphical representations (fig 5.1 to fig 5.22) are presented in the following order

- Load deformation behaviour,
- Axial Stress axial strain behaviour,
- Failure pattern.

- Effect Of Confinement Of CFRP On Square R.C Column Specimens
  - Load Deformation Behaviour (SR0, SR1, SR2):
    The load deformation variation of SR1 & SR2 column specimens are compared with SR0 specimen in fig5.1. Initially the load-deformation behaviour of all specimens coincide & is linear but deviate later. Though SR1 & SR2 specimens are expected to be slightly stiffer than SR0 specimens, this did not occur in the present experiment study. However, CFRP confinement contributes to appreciable increase in both ultimate load carrying capacity & ultimate axial deformation. During initial stages of loading, the load is carried by concrete and steel upto yielding of concrete and steel, and load is transferred to CFRP which confines the concrete. Because of this confinement of CFRP wrapping on the column, ultimate load carrying capacity of specimens wrapped with 1 & 2 layers of CFRP resist 1.35 times & 1.75 times higher load than that of unwrapped specimen. Ultimate deformation of SR1 & SR2 specimens increased by 1.37 and 2.91 times respectively that of unwrapped specimen, showing that CFRP confinement contributes not only to increase in load carrying capacity but also increases the ductility of specimens.

Fig 5.1 Load-deformation behaviour of R.C square column specimens confined with 1 & 2 layers of CFRP

- Stress Strain Behaviour:
  Fig 5.2 compares the stress strain behaviour of R.C square column specimens wrapped with 1 & 2 layers of CFRP with unwrapped specimen. Stress-strain behaviour of specimens is exactly similar to load deformation behaviour, because of the same area of cross section of all specimens. The ultimate axial stresses of specimen wrapped with 1 & 2 layers are 1.35 times & 1.75 times higher than that of unwrapped specimen. The ultimate axial strain of specimens wrapped with 1 & 2 layers of CFRP are found to be 1.37 times & 2.9 times that of unwrapped specimen, which are same as that of deformation. This shows how the compressive strength & ductility of R.C column specimens are further enhanced by the increase in the degree of confinement.

Fig5.2 Stress-strain behaviour of RC square column specimens confined with 1 & 2 layers of CFRP

  - Load Deformation Behaviour (Smc0, Cr0, Sr0):
    The load deformation behaviour curves of unwrapped square micro-concreted to circular (SMC0) specimen, CR0 specimen & R.C square column specimen (SR0) are compared as shown in fig 5.4. The load deformation behaviour of SMC0 specimens depicts to be more stiffer than CR0 & SR0 specimens, both of which exhibit the same load deformation behaviour till the failure of SR0 specimen (fig 5.4). Specimens SMC0 & CR0 record significant increase (1.71 times SR0) in ultimate load. This is because of the higher area of cross section of the two specimens. The ultimate load carrying capacity of SMC column specimen is found to be 1.71 times higher than that of R.C square column & comparable with CR0 specimen.

  - Stress Strain Behaviour
    Fig 5.5 compares stress-strain behaviour of SMC0, CR0 & SR0 specimens. The stress strain behaviour curves of SR0 & SMC specimens are similar almost upto 3/4th strength and deviate later. The strain developed in these specimens is almost half of that of CR0 specimen. However SR0 specimen can absorb slightly higher strain of 1.18 times that of SMC0 specimen. CR0 specimen resists 1.49 times & 1.23 times higher strain than SMC0 & SR0 specimens respectively.

Fig 5.3 Load deformation behaviour of SR0 , SMC0 & CR0 specimens

Fig 5.4 Stress-strain behaviour of SR0 , SMC0 & CR0 specimens

- Effect of CFRP Wrapping On SMC Specimens.
  - Load Deformation Behaviour (SMC0,SMC1, SMC2):
    The load deformation behaviour curves of Square micro concreted to circular specimens confined with 1 & 2 layer of CFRP (SMC1, SMC2) are compared with corresponding unconfined specimen (SMC0) in fig5.7. During initial stages of loading, load deformation curves for all coincide & are linear upto 200kN and then curves deviate, showing non-linearity.

Fig 5.5 Load deformation behaviour of SMC0 , SMC1 & SMC2 specimens

Because of high confinement of CFRP wrapping on SMC column, ultimate load carrying capacity of specimens wrapped with 1 & 2 layers takes 1.31 times & 2.15 times higher load than that of unwrapped specimen. Ultimate deformation of SMC columns wrapped with 1 & 2 layers of CFRP increased by 2.63 and 4.12 times respectively that of unwrapped specimen, showing that CFRP confinement contributes to both increase in the load carrying capacity & additional deformation capacity.

- Stress Strain Behaviour:
  Fig 5.8 compares stress strain behaviour of Square micro concreted to circular (SMC) specimen wrapped with 1 & 2 layers of CFRP with unwrapped SMC column specimen. Stress strain behaviour is exactly similar to load deformation behaviour, basically because of the equal area of cross section of all specimens. Ultimate compressive stress of SMC2 specimen is 81.2 MPa and the ultimate compressive strain of SMC2 specimen is found to be .002.

Fig 5.6 Stress-strain behaviour of SMC0 , SMC1 & SMC2 specimens

- Failure Patterns
  The behaviour of all column specimens were monitored visually during loading & the application of load was stopped just after the peak load (indicated by the pointer moving in the reverse direction) & failure of the specimen, the corresponding ultimate load & ultimate deformation were noted. The failure pattern was recorded after failure of the specimens
  - Unwrapped Specimens
The failure of the R.C square, integral circular & SMC column specimens (SR0) under concentric compression loading is shown in fig 5.17 (a), (b) & (c) respectively. The SR0 column specimen failed by crushing of concrete due to development of vertical cracks on the surface of the specimen. In case of integral circular (CR0) column specimen, as the load progressed, vertical surface cracking developed leading to crushing of concrete at ends. The failure of the square micro-concreted to circular (SMC0) column specimen leads to development of vertical cracks in the central zone of the specimen (SMC0), failed due to de-bonding of micro concrete at the interface with old concrete.

- **Column Specimen Confined With 1 Layer of CFRP Sheets.**

  Failure of R.C square column specimen (SR1) with corners rounded off & wrapped with 1 layer of CFRP is due to crushing of concrete & rupture of CFRP when load approached the ultimate load. Failure occurred near the top portion of specimen as shown in fig. 5.18 (a). The final failure occurred suddenly with an explosive sound. No de-bonding of CFRP overlap was observed. Failure of integral circular specimen wrapped with 1 layer of CFRP (CR1) was similar to SR1 specimen; however, failure was spread to bottom half portion of the specimen as shown in fig. 5.18(b). The failure pattern of SMC1 specimen was similar to CR1 specimen but extent of rupture was less than CR1 column specimen as shown in fig. 5.18 (c).

- **Column Specimen Confined With 2 Layers of CFRP (SR2, SMC2 & CR2)**

  The failure patterns of all specimens confined with 2 layers of CFRP (SR2, CR2 & SMC2) were similar to that of specimens confined with one layer of CFRP, but here, the rupture of CFRP generally occurred in the central portion of the specimen associated with slight crushing of concrete as shown in fig 5.19(a, b & c). Failure was characterized by explosive sound in all cases.
VII. CONCLUSIONS

- The axial compressive load- axial deformation and longitudinal stress-longitudinal strain responses of SMC specimens are found to be superior to square specimens and comparable with integral circular specimens.
- Retrofitting of square column specimen (SR0) by modified micro-concreting method (SMC0 specimen) is found to enhance the ultimate load carrying capacity by 1.9 times, which is also found to be equal to equivalent integral circular column specimens (CR0).
- Retrofitting by modified micro-concreting method was not found to increase the ultimate deformation but, the equivalent circular specimen showed ultimate deformation of 2.4 times that of SR0 specimen.
- Retrofitting R.C square column specimens with CFRP confinement (after rounding off the corners) results in considerable enhancement of the ultimate load carrying capacity & substantial increase in ultimate deformation.
  
The ultimate load & ultimate deformation of SR0 specimen increases by 1.35 times & 2.38 times for single layer CFRP confinement & 1.75 times & 3.91 times respectively for confinement of 2 layer of CFRP.
- The ultimate stress & ultimate strain of SR0 specimen are found to be 35.83 N/mm² & 0.0073 mm/mm. These respectively increase by 1.26 times & 2.38 times for single layer confinement & 1.78 times & 3.91 times respectively for confinement of 2 layer of CFRP.
- The increase in ultimate load of CFRP confined SMC specimens are very high compared to square (SR) specimens with CFRP confinement. Whereas, these are comparable to that of CFRP wrapped integral circular specimens, which shows the effectiveness of SMC specimens.
  
  In comparison to ultimate load of SR specimen confined with 1 layer of CFRP, the ultimate load of SMC specimen increased by 1.84 times that of square & in comparison to corresponding integral circular specimen enhanced by 1.15 times.
- Ultimate deformation of CFRP confined square, SMC & circular specimens are comparable to each other.
- The ultimate strain of confined specimens SR1, SMC1 & CR1 are 2.38 times, 2.63 times & 2.13 times higher than their respective unconfined specimens (SR0,SMC0,CR0) for single layer confinement, whereas for 2 layer of CFRP confinement, ultimate strains increased by 3.91 times, 3.60 times & 3.34 times with respect to their unconfined specimens.
The extent of enhancement of ultimate loads & ultimate strains due to CFRP confinement is almost same for different specimens considered.

As the compressive load progressed, all unconfined specimens developed vertical cracks leading to crushing of concrete at ends of specimens in Integral circular specimens and square specimens, but debonding at the concrete- micro concrete interface followed by some concrete crushing occurred in SMC specimens.

The failure in CFRP confined specimens was characterised by bulging of concrete prior to snipping and rupture of CFRP sheets, the rupture covering over 60% of height of columns. Crushing of concrete in case of square &Integral specimens and crushing of micro-concrete in SMC specimens also took place.

The failure of specimens confined with 1 layer of CFRP occurred at top or bottom portions of specimen, but in case of specimens confined with 2 layers of CFRP, failure generally occurred in the middle portion of column specimens.

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The Relationship of Organizational Culture and Return on Assets of large Manufacturing Firms in Kenya

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Abstract- The general objective of this study was to determine the effect of organization culture on return on assets of large manufacturing firms in Kenya. The specific objective of this study was to determine the influence of organizational culture on return on assets of large manufacturing firms in Kenya. The study was a cross sectional survey targeting 102 large manufacturing firms and the response rate was from 94 firms. The data was analyzed using Statistical Package for Social Sciences. Null hypothesis was tested and results indicated that organizational culture had influence on return on assets. The study was limited in that change of variables of study was not monitored or observed over time as would be the case with longitudinal studies.

Index Terms- Organizational culture, Return on assets (ROA), Manufacturing firms, Performance, power distance

I. INTRODUCTION

There have been debate whether organizational culture influence return on assets or not. The study aimed at establishing the position regarding this debate in Kenya large manufacturing firms. Organizational culture is an idea in the field of organizational studies management which describes the psychology, attitudes, experiences, beliefs and values (Schein, 2009). This study used return on assets as measure of performance. The Kenya manufacturing sector decelerated from an expansion of 3.4 percent in 2011 to a growth rate of 3.1 percent in 2012. The slower growth was due to high cost of production, stiff competition from imported goods, high cost of credit and political uncertainty due to the 2013 general elections (Kenya National Bureau of Statistics (KNBS), 2013). Manufacturing exports are targeted at both regional markets, including the Common Market for Eastern and Southern Africa (COMESA) and the East African Community (EAC) as well as European and American markets. Kenyan manufacturers have in recent years through African Growth Opportunity Act (AGOA) and associated export processing zones, increased exports of textiles, mainly targeting the US market.

Karabag and Berggren (2013) study, based on 1,000 largest manufacturing firms in Turkey found that firm related factors did not significantly influence performance, instead factors related to industry culture and business groups membership were the strongest determinants of firm perspective. Chen (2010) showed that firm factors explained a substantial part of Korean and Taiwanese firm performance. Review of previous studies indicates they have been conflicting results and this study sought to determine the relationship of organizational culture and return on assets of large manufacturing firms in Kenya.

II. RESEARCH OBJECTIVE

The specific objective was to determine the influence of organizational culture on return on assets of large manufacturing firms in Kenya.

III. LITERATURE REVIEW

Organizational Culture and Performance

Organizational culture is an idea in the field of organizational studies management which describes the psychology, attitudes, experiences, beliefs and values (personal and cultural values) of an organization (Schein, 2009). One of the major reasons for the widespread popularity and interest in organization culture stems from the argument (or assumption) that certain organizational cultures lead to superior organizational financial performance.

Cameron and Quinn (2005), emphasize that the success of organizations is not only determined by external conditions but concluded that the remarkable and sustained success of some US companies “has had less to do with market forces than with company values” (Cameron & Quinn, 2005, p. 4).

O’Cass and Viet (2007), suggest that organizations with an innovative culture will attain better performance not only through getting feedback from customers and their present competitors but also by means of the organization’s capability for creative extension of unique methods for delivering special value to customers. More than 60 research studies were conducted between 1990 and 2007, which covered more than 7,600 small business units and companies to find out the cultural impact on the organizational performance (Gallagher, 2007). Results of these studies showed positive association between strong culture and performance. Fazli and Alishahi (2012) study found that culture, strategy and knowledge management had positive influence on performance.

Newbert (2007) categorized theoretical approaches into four types resource heterogeneity, organizing approach, conceptual-level, and dynamic capabilities. The resource heterogeneity approach argues that a specific resource, capability, or core competence controlled by a firm, affects its competitive advantage or performance. Henderson and Cockburn (1994), Carmeli and Tishler (2004), studies of local government authorities in Israel identified that organizational culture and perceived organizational reputation were the two most significant variables relating to organizational performance in the Israel.
Organizational culture refers to the underlying values, beliefs, and principles that serve as foundation for the organization’s management system as well as the set of management practices and behaviors that both exemplify and reinforce those basic principles (Denison, 1990). Organizational culture serves as a function to explain the type of activity that the organization is engaged upon and the lifecycle stage that the organization has reached.

Zheng, et al., (2010) also describes organizational culture as a mode, composed by some basic assumptions and the assumptions are found and created gradually by a certain group in the process of exploring the method of adapting to external environment and solving internal interconnected system. Internal integration is the socialization of new members in the organizations, creating the new boundaries of the organization and the feeling of identity among personnel and commitment to the organization.

Hofstede (1980), used the gathered data from International Business Machines (IBM) employees from more than 50 countries and classified organizational culture into four dimensions; power distance (the degree in which employees and management have distant relationship, formal and informal); individualism (the degree in which people may create difference between interest of organization and self-interest); uncertainty avoidance (the level in which people are willing to mitigate the uncertainty and tolerant of ambiguity); and masculinity (the level in which success is defined as the ambition, challenge and insolence, rather than caring and promotion). Denison (1984) used data from 34 American firms on cultural performance over a period of five years and scrutinized the characteristics of organizational culture and tracked the performance over time in these firms. Denison (1984) found that organizations that have participative corporate cultures and well organized work places had a better performance records than those that did not.

Companies with participative culture had a ROI that averaged nearly twice as high as those in firms with less efficient cultures. Theorists also argue that SCA arises from the formation of organizational competencies, which are both superior and incorrectly imitable by competitors (Saa-Pere, et al., 2002). Practitioner and academics suggested that the performance of an organization is dependent on the values of the culture (Denison, 1990). In Denison’s model, comparisons of organizations based on relatively more ‘‘surface-level ’’values and their manifest practices are made. Such values are deemed both more accessible than the assumptions and more reliable than the artifacts (Denison, 1990).

Denison (1990) organizational culture model was based on four cultural traits involvement, consistency, adaptability, and mission that had been shown in the literature to have an influence on organizational performance (Denison, 1990). The four traits of organizational culture in Denison’s framework was that effective organizations empower their people, build their organizations around teams, and develop human capability at all levels. Olanipekun, et al., (2013), study on quantity surveying firms in Nigeria found that organization culture influenced performance

**Conceptual Hypothesis**

The conceptual hypothesis for the study was Organizational culture does not influence return on assets of large manufacturing firms in Kenya.

**IV. RESEARCH METHODOLOGY**

This study was based on the positivist paradigm because it had predefined hypothesis. The study was a cross sectional survey to collect data at particular time rather than over a period of time. The population of the study was all large manufacturing firms in Kenya (KAM 2011); there were 102 large manufacturing firms in Kenya. In determining the size of the firm, several different measures have been used and accepted as appropriate. They included turnover, capital employed, value of output, asset size and employment level. The indicators of large manufacturing firms in Kenya include a firm with more than 50 employees (Awino, 2007); KIRDI (2007); (Aosa, 1992), sales per employee KShs 60,000 and sales turnover of excess of KShs 400 million (Waweru, 2008).

The study used the number of employees to determine the size of the firm. Firms with more than 50 employees are considered large (Awino, 2007, KIRDI, 2007, Aosa, 1992). The use of number of employees is considered most appropriate since the studies were conducted in Kenya under similar conditions. Basing on the number of employees out of 627 manufacturing firms in Kenya, there are 102 large manufacturing firms with over 50 employees (KAM, 2011) and this formed the target population and the study used census survey. The study used both primary and secondary data; the primary data was collected using questionnaire. Questionnaire was delivered to top level managers and middle level managers which included Chief Executive Officers (CEOs)/managing directors and head of departments. Data was analyzed using Statistical Package for Social Sciences (SPSS) through a combination of both descriptive and inferential statistics. The F test of significance was performed to determine if the variables significantly contributed to the prediction of the dependent variable. Overall significance used F-test and p-values. When p-value ≤ 0.05, the null hypotheses were rejected, otherwise they were not rejected. To test individual significance, t-test and p-values were used using the same level of significance (α = 0.05).

The data was subjected to reliability tests to check consistency of the measurement set. Reliability was operationalized as internal consistency and established through computation of Cronbach’s alpha coefficient, where all the variables had Cronbach’s alpha coefficient of more than 0.70 and therefore the data was reliable. Content validity was tested through expert judgment comprising of managers in manufacturing firms and scholars in strategic management. The relationship of dependent variable return on assets (ROA) and organizational culture (OC) is as follows. Model: \( \text{ROA} = \beta_0 + \beta_1 \text{OC} + \varepsilon \) where \( \beta_0 \) is the constant and \( \beta_1 \) is the coefficient (slope or gradient) and \( \varepsilon \) is the error term.

**V. RESULTS AND DISCUSSION**

The specific objective was to determine the influence of organizational culture on return on assets of large manufacturing firms. To test this objective, null hypothesis; organizational
culture does not influence return on assets of large manufacturing firms was tested at 0.05 significance level. Table 1 below indicates relationship between organizational culture and return on assets.

The objective of the study was to determine the influence of organizational culture on performance of large manufacturing firms. To test this objective, null hypothesis; organizational culture does not influence performance of large manufacturing firms was tested at 0.05 significance level. Table 1 indicates relationship of organization culture and performance measured in terms of ROA. The coefficient of determination was 0.072 indicating that organization culture explained 7.2 percent of variation in ROA in large manufacturing firms in Kenya. The remaining 92.8 percent was explained by other variables not within this study.

The overall test of significance using F-value statistic was 7.168 which was significant because p-value (0.009) was less than 0.05 significance level and the null hypothesis that organizational culture does not influence performance with respect to ROA of large manufacturing firms at 0.05 significance level was consequently rejected. This means culture significantly influences ROA. In order to establish individual significance t-test was carried out.

Further, Table 1 indicates that the constant coefficient was not significant but the organizational culture coefficient was significant ROA= 0.038 OC
(0.009)

This implies that a unit marginal change in organization culture results to increase in ROA of large manufacturing firms by Kshs 0.038. When organization culture is equal to zero there is no effect on ROA. This implies that the organization should emphasize on having the appropriate culture to enhance the organizational performance.

Table 1: Relationship Between Organization Culture and Return on Assets

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.269</td>
<td>0.072</td>
<td>0.062</td>
<td>0.06930</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Organization Culture

<table>
<thead>
<tr>
<th>Model</th>
<th>Regression Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.034</td>
<td>1</td>
<td>0.034</td>
<td>7.168</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>Residual Sum of Squares</td>
<td>0.92</td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.424</td>
<td>0.93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: ROA
b. Predictors: (Constant), Organization Culture

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t-value</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant) Organization Culture</td>
<td>-0.046</td>
<td>0.038</td>
<td>0.58</td>
</tr>
</tbody>
</table>

Dependent variable ROA

The results were inconsistent with Ogolla (2012) who found that ROA was not related to the organization configuration in the banking industry. The results were also inconsistent with Yin-His (2012) study that found that culture had no impact on financial performance. The results are consistent with Fazil and Alishahi (2012) study which found that culture had positive influence on performance. Similarly, Aluko (2003) study of Nigeria textiles found that culture had significant positive influence on organization performance.

VI. CONCLUSION

The study established that organization culture explained significantly the variation in ROA of large manufacturing firms in Kenya. The management of manufacturing firms should ensure they have an organization culture that will positively contribute to the ROA.

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The Synthesis and Characterization of Metal Oxide Nanoparticles and Its Application for Photo catalysis

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Abstract- In the present study different metal oxide nanoparticles (Magnesium, Zinc and Copper) were synthesized using two different methods wet chemical method and hydrothermal method. These nanoparticles were characterized using FESEM, EDAX and XRD to investigate their structural and morphological properties. Their potential for dye degradation is experimentally verified. XRD data was used to calculate the particle size using Debye Scherrer formula and it was found to be in the nano-range. SEM analysis also supported that metal oxide particles are in the nano-range with varying morphology. EDAX confirms the presence of metals Zn, Mg and Cu in the respective oxides. The dye degradation activity of ZnO, MgO and CuO nanoparticles were investigated by the degradation of methylene blue (MB) and Eriochrome black-T(EBT) dye in aqueous medium under natural sunlight. Results indicate that MgO nanoparticles have better photocatalytic efficiency under natural sunlight as compared to ZnO and CuO nanoparticles for methylene blue dye and ZnO nanoparticles higher dye degradation for Eriochrome Black-T dye. Such photocatalytic activity was not observed for metal oxides in bulk and also was not observed in dark conditions. Wet chemical route for synthesis of nano-metal oxides was found to be very simple, cost-effective technique for development of metal oxide nano-particles. This can be developed as effective method for dye degradation thus reducing organic dye waste load from effluents of industries.

Index Terms- Hydrothermal Method, Metal oxide nanoparticles, Photocatalysis, SEM, Wet-Chemical Method, XRD

I. INTRODUCTION

Transition metals due to their variable oxidation states form oxides of different stoichiometry. These metal oxides have various geometrical structures which in turn lead to different chemical and electronic properties. Metal oxide nanoparticles due to their smaller size have properties different than those in the bulk. Out of large number of metal oxides present in nature; some of the metal oxides are most useful in accordance with their applications to day to day life in science and technology. Physico-chemical properties of metal oxides have special relevance in chemistry mostly related to the industrial use of oxides as sensors, ceramics, adsorbents and catalysts.

Dye can be colored, ionizing and aromatic organic compound which shows an affinity towards the substrate to which it is being applied. It is generally applied as a solution that is aqueous or oil base and requires a mordant to improve the fastness on the material on which it is applied. Dyes have many functional variations like acidic, basic, disperse, azo, anthraquinone based and metal complex and others.

Dyes are used in industry on large scale for various applications from production of plastics/textiles/fabrics and many more things. After the use when plastic/textile is scraped what happens to the dye needs to be examined. In the present study dye degradation ability of Mg, Zn, Cu oxide nanoparticles has been studied. This has direct industrial application like after use toxic organic dyes can be degraded using nano metal oxides so that they do not enter local water body; they will be separated, disposed or recycled.

The textile industry is the largest consumer of dye stuffs. During the coloration process, a large percentage of the synthetic dye does not bind and is lost to the waste stream (Weber and Adams, 1995). Approximately 10-15% dyes are released into the environment during dyeing process making the effluent highly colored and aesthetically unpleasant (Ratna and Padhi, 2012). Dyes have been applied in many industries such as textiles, printing, leather, pulp, food and plastics, etc. The effluent from these industries normally contains presence of these dyes. About 10,000 different commercial dyes and pigments exist and more than 7x10³ tons are produced per year worldwide (Shah et al., 2010). Approximately 10-15% of these dyes are released after dying process (Al-Degs et al. 2008).

Many organic dyestuffs are harmful to human being and toxic to animals and microorganisms. Hence now a days it has been made manditory to remove the spent dyes before its release in to natural water bodies. Various dye removal process have been used such as coagulation, chemical oxidation, membrane separation, electrochemical process, biological treatment and adsorption techniques (Durai and Rajasimman 2011). Adsorption was recognized to be an effective process for the removal of dyes from waste water which are the easiest for separation and highly effective in dye removal (Orthman et al., 2003). Different kinds of adsorbents have been developed for various applications such as activated carbon (Iqbal et al., 2007), active carbon from pyrolysis of bagasse (Lori et al., 2008), spent activated clay (Weng et al., 2007), soil (Cheng et al. 2008), kaolin (Nandi et al., 2009), CuO NPs and carbon-encapsulated super magnetic colloidal NPs (Wang et al. 2013). (Ghulam et al 2013).

In the present work, CuO, ZnO, MgO nanoparticles have been synthesized by two simple methods and their potential for dye degradation is experimentally verified and utilized as nano adsorbents for the removal of organic dyes. The XRD and morphological study of oxide-nanoparticles was observed by scanning electron microscopy (SEM).

ZnO nanoparticles are used for many applications including an activator of accelerator in the vulcanization process as a form...
control in lattices and photocatalyst. Using ZnO particles show a high degree of transperancy, making them useful in sunscreens, paints, varnishes, plastics and cosmetics especially for broad UV A(315-400nm) and UV B(280-315nm) blocking (S. Sultana 2013).

The oxides of transition metals are an important class of semiconductors having applications in multiple technical fields like solar energy transformation, magnetic storage media, electronics and catalysis among the oxides of transition metals. Copper oxide nanoparticles are of special interest because of their efficiency as nano-fluids in heat transfer application. CuO is the basis of several high Tc semiconductors. CuO is a semiconducting material with a narrow band gap and used for photoconductive and photothermal applications opposite to n-type semiconducting metal oxides. CuO is p-type semiconductor with a band gap of 1.2-1.9 eV (S. Raja, 2015) Zinc oxide is the one of the most important n-type semiconductor materials with a 3.37 eV band gap at room temperature and that is in the UV region and makes this nanoparticle as an efficient UV absorber. NanoMgO is a functional material which is used in various areas like photocatalysis, antibacterial activity etc.

In the present paper, we report the comparative study of these three metal-oxide nanoparticles done for the first time.

II. EXPERIMENTAL MATERIALS AND METHODS

A. Chemicals

All chemicals used in the experiment were of analytic reagent grade. Copper nitrate, Zinc nitrate, Magnesium nitrate, sodium hydroxide, zinc acetate, methanol, methylene blue(MB) and Eriochrome black-T(EBT) dyes. De-ionized water was used throughout the experiment.

B. Synthesis Of Metal Oxide Nanoparticles

In the preparation by wet chemical method, Metal oxide nanoparticles were synthesized by using 0.2 M solution of M(NO3)2 and 0.4M NaOH The nitrates of the respective metals were dissolved in water to which sodium hydroxide was added drop-wise with continuous stirring at room temperature leading to generation of metal hydroxides. The stirring was continued for 6 hrs at 85⁰C. The reaction mixture was then filtered and dried in oven at 60⁰C. These hydroxides were calcined in furnace at 600⁰C and oxide nanoparticles were obtained. The product was characterised by SEM, EDAX and XRD.

In the hydrothermal method acetate salt of the metal dissolved in methanol was reacted with sodium hydroxide in a Teflon lined sealed autoclave and heated under autogenous pressure at 110⁰C for 6 hours in an oven. The product was then filtered, washed, dried and characterised.

C. Characterisation

The powder X-ray diffraction (XRD) analysis was performed by using X-ray diffractometer Bruker D advance in the scanning range from 20 to 80 at average rate. Surface morphology of synthesized products was carried out by SEM analysis using Model SIGMA HV with resolution 20KV to 1KV and magnification x50-10,000,000 and accelerating range 0.1-30 kV.

D. Measurement Of Photocatalytic Activities

Frequently used organic dyes, namely, Eriochrome black-T (EBT) and Methylene blue(MB) were degraded photochemically using metal oxide nanoparticles.

Figure 1.Structure of Methylene blue dye
The photocatalytic activity of as synthesized MgO, CuO and ZnO was performed using Methylene blue dye and Eriochrome black-T dye as degraded materials under natural sunlight irradiation. 2.5 ml dye solution was mixed with desired concentrations of catalysts. Before irradiation, suspension was stirred magnetically for 30 minutes in dark conditions until adsorption-desorption equilibrium was established. Then suspensions were irradiated by light sources without stirring. Under natural sunlight irradiation, all experiments were done inside the laboratory in an open atmosphere between 10:00 am to 4:00 pm.

III. RESULTS AND DISCUSSION

A. Structure And Morphology

X-ray studies

XRD data was used to confirm the phase formation and calculate the particle size. Average particle size for different specimens was obtained from the main peaks using the Debye Scherrer equation $D = \frac{0.89\lambda}{\beta\cos\theta}$. Where $D$=crystallite site, $k$=shape factor =0.89, $\theta$ =diffraction angle at maximum peak intensity, $\beta$=full width at half maximum of diffraction angle in radians, $\lambda$ = x ray wavelength. (In X-ray diffraction, some prominent peaks were considered and corresponding d-values were compared with the standard.)

Figure 3 is the X-ray diffractogram of MgO nanoparticles obtained by calcining Mg(OH)$_2$. The product had peak at 44$^\circ$ assigned to 111 plane indicating complete transformation to MgO. The crystallite sizes were calculated using diffraction maxima from the half-width of diffraction peaks using Debye Scherrer equation. d-values were compared with standard JCPDS files and showed presence of pure oxides.

Figure 4 X-ray diffraction pattern of ZnO nanoparticles show sharp and well defined peaks. It indicates the good crystallinity of synthesized material. The observed 2$\theta$ values are consistent with the standard JCPDS values (JCPDS No.80-0075) which specify the wurtzite structure of ZnO nanoparticles d-values were compared with standard JCPDS files and showed presence of pure oxides.

Figure 5 X-ray diffraction of synthesized copper oxide nanoparticles is shown. X-ray diffraction pattern of pure copper oxide indicated that copper oxide in the form of CuO. (In X-ray diffraction, some prominent peaks were considered and corresponding d-values were compared with the standard [JCPDS file No. 05-661] X-ray diffraction shows that metal oxide is pure CuO.)
Figure 4: XRD pattern of ZnO nanoparticles

Figure 5: XRD pattern of CuO nanoparticles

Table 1: Crystallite Size Calculation from XRD

<table>
<thead>
<tr>
<th>Sr No</th>
<th>Area</th>
<th>Centre</th>
<th>Height</th>
<th>Crystallite Size</th>
<th>Lattice Strain</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For MgO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
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<td>42.88</td>
<td>1164.70</td>
<td>10.44</td>
<td>0.0095</td>
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<tr>
<td>2.</td>
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<td>62.245</td>
<td>541.27</td>
<td>11.75</td>
<td>0.0060</td>
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<td>For ZnO</td>
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</tr>
<tr>
<td>1.</td>
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<td>2734.00</td>
<td>37.3</td>
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<tr>
<td>2.</td>
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<td>36.27</td>
<td>4960.00</td>
<td>34.79</td>
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<td>3.</td>
<td>653.00</td>
<td>34.45</td>
<td>2028.00</td>
<td>33.84</td>
<td>0.0036</td>
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<tr>
<td>4.</td>
<td>403.34</td>
<td>47.58</td>
<td>1263.00</td>
<td>35.63</td>
<td>0.0025</td>
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<td>5.</td>
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<td>54.64</td>
<td>1888.00</td>
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<tr>
<td>6.</td>
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<td>7.</td>
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<tr>
<td>For CuO</td>
<td></td>
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<td></td>
</tr>
<tr>
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<tr>
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<td>5.</td>
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<td>66.191</td>
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</table>
Zinc oxide nanoparticles are fine with spherical shape and average grain size of about 72 nm. MgO most of the particles are in the range 10-20 nm with spherical morphology. CuO particles showed rod shaped/ellipsoid morphology. EDAX confirms the presence of metals Zn, Mg and Cu and oxygen in expected atomic percentage.

IV. MECHANISM OF DYE DEGRADATION

Degradation of dyes is due to the reason that nanoparticle catalysts used are semiconductor in nature which upon photo-illumination generate electron-hole pairs. The generation of electron-hole pairs is responsible for the photo-degradation of different dyes. Further the photo-degradation of dyes was found to be dependent on initial dye concentration.

Since initially it is the adsorption of dye on the nanoparticles followed by the photo-catalytic degradation process, therefore the possible explanation could be that at this dye concentration maximum number of active sites on the surface of catalyst is available for adsorption of dyes. As the concentration increases, the active sites for adsorption present on nano-particles get blocked thus the rate of dye degradation decreases.

V. CONCLUSION

- Among two methods of preparation the hydrothermal method seemed to be better than the wet chemical method with respect to particle size. Photo-degradation of all the dyes was found to be dependent upon the concentration of the catalyst (In this case metal oxide nanoparticles).
- EBT degradation was faster by ZnO than MgO whereas MB degradation was faster by ZnO nanoparticles. 90% MB is adsorbed at 665nm by MgO in 6 hrs Whereas 80-85% EBT was adsorbed by ZnO at 620nm during a time interval of 4hrs.

VI. ACKNOWLEDGEMENT

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Correspondence Author – Mrs Deepali Butala, deepali.butala@gmail.com. 9373475132
Abstract- This paper aims to reveal the concept of the actualization of the New Public Service (NPS) in the administration of public services to see how far employees perform administrative services of government in serving the public interest in order to satisfy the elements of efficiency, effective, economical, equitable and responsive to the needs and welfare of the community. This paper uses search techniques theories of public administration with regard to the concept of New Public Service (NPS) in order to achieve efficiency, effective, economical, equitable and responsive to the implementation of the public service administration. Based on the various interests of the community are very complex and dynamic in accordance with the demands of the development needs of the community and the environment. From the context of Indonesia today are faced with the dynamics of globalization and increasingly competitive economic environment, the government must act professionally so as to reduce the adverse impact to the community. The demands of globalization today is not only a challenge for businesses, it is now evident that the organizers of public administration should perform excellent service to meet the quality of life and welfare of the community. From this discussion, put forward the concept of a paradigm change in administration in the era of globalization as contained in the concept of the New Public Service (NPS) now needs to be done in a variety of dimensions. One dimension was bureaucratic behavior is behavior both individual and institutional bureaucracy should not have too much more influenced by the views of the "power" (power / authority). The second dimension, the quality of public services reorientation in the philosophy of state administration itself time should prioritize the aspects of effectiveness, economical, equitable and responsive. Thus, through the actualization of the New Public Service (NPS) in the administration of public services can amend the quality of life and well-being of society toward a better.

Index Terms- Efficiency, Effectiveness, Economic, Justice and Responsive

I. INTRODUCTION

Based on the development needs of the public service should display professionalism, the government is also required to design a public service that is managed democratically. Public services are implemented by the government have orientation is customer oriented or customer's perspective or services oriented to the interests and needs of the public. A real public service in the midst of the needs and interests of the public so no wonder the public service must be done democratically. Good public services in accordance with citizen charter became prominent after their demands gave more space for the public to participated in the public service. The concept of public services based on citizen charter can provide a rational demands to provide a sense of community satisfaction with the services provided by the government. In a system of government that puts the public service given the opportunity to provide information about the mechanisms and procedures clearly. Citizen charter opportunities birth of dialogue between government and the public. So that both sides, find solutions and provide the best for the improvement of services (Indiahono, 2009).

The paradigm shift of public service for public organizations must start to be directed towards the satisfaction of the public. For in earlier times known classical paradigm of public services, and new public management that has now been deemed irrelevant (Denhard, 2003). Classical public organizations organized a public service through the internal control mechanism, thus closing the door to criticism and opposition to the services performed. This paradigm is a consequence of public services operated at the level of accountability is low, because only recognize internal evaluation only.

Concept fundamental changes in the body of the modern bureaucracy as well as the expectations for this, of course, can not take place automatically given the bureaucracy in practice everyday encounter some problems or illnesses bureaucratic aspects of accountability, work discipline, integrity, efficiency and effectiveness in the dynamic implementation of today's bureaucracy.

Appearance public services are characterized by the culture of power, the public becomes a component of the most disadvantaged. The culture of power in the bureaucracy of the most dominant impact neglect of functionality and good service culture of bureaucracy as a community service. At the level of the actual practice various irregularities committed by the bureaucracy, such as corruption, collusion, nepotism, going without can be prevented effectively. Fraud committed by the bureaucracy as a public service for public service users to make society as an object of services that can be exploited for personal gain or the officials of the bureaucratic apparatus. The performance of bureaucratic inefficiency in the administration of government activities and public services is still going on. Inefficiency of government activities and public services seen from the frequent occurrence of inaction and leakage of government services. The number of civilian bureaucracy is too large is one factor that contributes to the inefficiency of public services (Dwiyanto et al., 2006).

Reform of the bureaucracy is a fundamental arrangement that is expected to have an impact on changes in systems and
structures. The system is related to the relationship between the elements and the elements that influence each other and are associated and form a totality. Changes to an element presumably can affect other elements in the system itself. Structure associated with the order are arranged in a regular and systematic. While changes in the structure includes mechanisms and procedures, human resources, facilities and infrastructure, the organization and the environment in the framework of the implementation of goal attainment efficiency of government bureaucracy. These changes include all aspects that allow bureaucrats have adequate ability in performing the duties and functions of the principal. The failure of the bureaucracy to serve the public during this same time represent poor governance from both central and local government level (Mustafa, 2013).

Reinventing government is a description of an ideal government that can be adopted by States to the administrative practice of the State, while Banishing bureaucracy constitute concrete steps to improve the bureaucracy that is able to drive the transformation of the bureaucracy to be able to carry out entrepreneurship which produces life and more optimal performance. Ideas Ferlie et al., and Vigoda, basically emphasizes how to execute more quickly banishing bureaucracy can be implemented, because the ideas put more emphasis on the operational level, what ought to be implemented by the administration of the State to improve the bureaucracy and its performance.

Osborn and Gablier cites the opinion of J. B. Say that entrepreneurship is the spirit which seeks to change the economic resources out of low productivity level towards higher productivity and greater yielding. Thoha (2005), entrepreneurship government bureaucracy does not mean any officer or officers are required to trade or trying like entrepreneurs. Or teach government officials to attempted like entrepreneurs. But their efforts to officials with all components public agencies that continue to work hard to improve so that a potential source of economic resources that were found by the agency government from unproductive to productive, from the production low to be upgraded to a higher production. Therefore, the principle of reinventing government that was to transform the performance of the business world to the performance of government organizations.

Frederickson (1997) explicitly states that the public services provided by the government or public administration should be oriented to the citizen (citizens), a citizen is deemed not only to consumers or customers (customers). The views of citizens as customers are consistent with the interpretation of economics to political life. Denhardt and Denhardt (2003) that government Ultimately Reflects the accumulated self-interests of largely disconnected and utility maximizing individuals.

The views treats citizens as costumers, it is the job of government is to satisfy the customer, the sentence is the central idea in The New Public Management paradigm. In the view of The New Public Service idea of citizens as customers often also cause a conflict at the level of practice and academic, such as foreign policy and environmental protection, it can not be linked to individuals costumers, but all individuals in a society accept these services, not to be want matter whether they were or not. In other cases, the government is obliged to serve compulsory education, it can not be said that children aged 7 to 15 years (age studying elementary to SMTP) is said to be a customer of educational institutions, more precisely is the government's obligation (obligation). Although in practice the government is obliged also create guidelines for minimum services.

But The New Public Service also recognizes the advantages of views within the paradigm of New Public Management, especially attention on individual performance, organizational performance, innovation, accountability and creative in finding solutions in an attempt to improve the quality of service. The effort is apparent from the principles of reinventing government, by applying the spirit of entrepreneurship to in public organizations, the principles customer driven government that puts people as customers who have served and satisfied. Thoha (2005) was essentially reinventing government is attempting to transform the life and performance of self-employment (entrepreneurship) into the bureaucracy of government. The entrepreneurial spirit emphasis on efforts to increase resources in economic, social, cultural, political, which is owned by the government of unproductive to productive than low productivity into high productivity.

The public interest as a reflection of the interests of society are varied and dynamic in accordance with the development of society and the environment. In contexts Indonesia are faced with the dynamics of globalization and competitive economic environment, the government must act quickly so as to reduce the negative impacts. The global competition is not only a major industry challenges, it is now evident that the small industries are also affected and have to deal with it, which impact the quality of people's welfare. In this regard, the quality of public services related to the industry is the domain of the public interest. Caiden, in Thoha (2005) the discipline of public administration is in essence is a discipline that respond to the problems of implementation problems of society (public affairs) and the management of the efforts of the community (public business).

The paradigm change of administration in the face of this current era of globalization needs to be done in a variety of dimensions. The first dimension, concerning the behavior of the bureaucracy. The behavior of both individual and institutional bureaucracy very influenced by the views of the "power" (power / authority). The second dimension, reorientation in the philosophy of state administration itself. Seen from this dimension, utilization of civil servants includes three things, which include among others: (1) The introduction in depth the various "basic fundamentals" of good administration concerning the components and elements with a systematic and rational way of thinking; (2) Represents the various paradigms to handle the operational "basic fundamentals" as instrument analysis; (3) The object of the application is seen as critical to the success of efforts to improve efficiency, effectiveness, and employee productivity. The third dimension, associated with the trend going in the world today, which include trend shifting of model of authoritarian toward democratic governance, the trend of globalization in all fields, especially economics (free trade) and information technology (information technology), as well as the trend of good governance Changes in public administration paradigm is changing and the shift from authoritarian rule / tyranny towards government that puts the will of the people (democracy) to create a civil society (civil society).
Civil society (civil society) is plural society that has civilization (various), uphold. Human Rights and democratic. Civil society constitute one "leg" of three feet of good governance and civil society therefore has a strategic role in creating good governance. Actualization of good governance in the reform of the state apparatus, through the optimization of the role and functions of the three domains, namely the public sector, private and civil society, based on the principles of accountability, transparency, openness, based on the law and the guarantee of fair and equitable treatment (fairness).

The implementation of good governance (good governance) represents the ideals of the Republic of Indonesia. Such governance based on the principles such as upholding the rule of law, professionalism, accountability, transparency, and participation, both in the management of policy and service delivery to the public.

Community service done excellent (excellent services), which is transparent, high quality, efficient, democratic and fair. Performance of employees in the system of democratic governance is largely determined by how far people gain access to the same services without distinction of origin, ethnicity, religion or political aspirations. Within this context, the resources of government officials neutral political forces that there is very necessary for good governance and commanding (good governance).

On the other hand, employees also have to run a social function internally and externally to ensure the smooth implementation of effective public administration and efficient work. To get quality human resources professionals must have a competitive advantage that should be owned by an employee, will only be obtained by employees productive, innovative, creative, motivated, always passionate and loyal. Employees who meet the criteria as it would only be acquired through the application of concepts and techniques of human resource management with the right spirit and high motivation as well as an effective leader and a supportive working environment. Factors that can be used to improve employee performance, including motivation and performance, Robbins (2001). The complexity of the problems of the actualization of the concept of New Public Service (NPS) in the administration of public services in order to realize the implementation of quality of public administration, the key problem can be formulated as follows: "How is the actualization of the New Public Service (NPS) in the administration of public services".

THE BENEFITS OF WRITING

1. To show the government administration that the actualization of NPS in the administration of public services further demonstrate the concept of democratization of the exercise of government.

2. As knowledge development efforts with respect to democratic governance as the actualization of NPS in managing public services that meet the criteria of effectiveness, economical, equitable and responsiveness to increase social welfare.

II. RESEARCH METHODS

This paper uses search techniques theories of public administration with regard to the concept of the New public Service (NPS) in order to Achieve efficiency, effective, economical, equitable and responsive to the implementation of the public service administration.

III. RESULTS AND DISCUSSION

The thoughts that develop in the old public administration heavily influenced by the idea of Woodrow Wilson, in Denhardt (2003). The idea of Woodrow Wilson can is known of the following: (1) The Government should establish executive authorities, controlling Essentially hierarchical organization and having as their goal Achieving the most reliable and efficient operations possible; (2) Their tasks were (public administration) instead the implementation of policy and the provision of service, and in Reviews those tasks they were expected to act with neutrality and professionals to execute faithfully the direction that Came Reviews their way. Not to be Actively Involved or extensively in the development of policy; (3) They were to be watched carefully and held accountable to Elected political leaders, so as not to deviate from established policy; (4) Wilson recognized a potential danger in the other direction as well, the possible that politics, or more specifically, corrupt politicians might negatively influence administrators in their pursuit of organizational efficiency.

Wilson idea can be summarized in two major themes, namely: (1) the idea that the separation of politics and administration, and is very influential in Western countries to over 50 years (the idea of Wilson in 1830). Politics should relate to policy or issues relating to the destination country. Administration of the State as an executive agency to implement the wisdom apolitical and impartial manner. When a policy has been established that is where the new State administration work. Public administrators must implement accountability to the political officials who have been elected (administrators were held to be accountable to Reviews their political masters - and only through them to the citizenry); (2) Public administrators must seek efficiencies as large as possible in its operations and also achieve the best efficiency in achieving its goals by integrating the uniformity and it should happen in a hierarchical structure of management administrative regular and steady (technical and operational guidelines). This is supported by the growing view of Frederick W. Taylor and Lyndall Urwick & Luther Gulick. Taylor's The Principles of Scientific Management found more human occupations can achieve greatest efficiency if based on time and motion studies. While Urwick & Gulick with the organization as a Technical Problem to introduce the principles of administration with the acronym POSDCOORB, which explicitly states that POSDCOORB can be applied in all conditions and free space and time. This means that these principles can be implemented at all levels of administration and all circumstances irrespective of whether it is in developing countries or developed countries, if the goal is to get the goals and objectives of the administration as efficiently and effectively as possible.
New Paradigm of Public Service (NPS) there are seven (7) the principle of NPS (Denhardt & Denhardt, 2003) which is different from the OPA and NPM. (1) The primary role of public servants is to help citizens articulate and meet the interest that has been agreed, rather than trying to control or control of society in a new direction; (2) The public administrator must create a collective idea of jointly agreed on the so-called public interest; (3) Policies and programs aimed at meeting the needs of the public can be achieved effectively and responsive through the collective efforts and the collaborative process; (4) The public interest over private interests is an aggregation of individuals; (5) Public servants must pay attention, not only to the market, but also on the legal and regulatory aspects, community values, political norms, professional standards and the interests of citizens; (6) Public organizations and networks that are involved more successful in the long run if they operate through a collaborative process and through the leadership that respects everyone; and (7) The public interest is better served by public servants and citizens who are committed to contribute to society, rather than by entrepreneurial managers who act as if money is theirs. NPS to support the actualization of the administration of quality public services as follows:

1. Dimensions of Behavior Bureaucracy

Bureaucratic behavior is a function and the interaction between an individual and his environment, where the behavior of a person is determined not only by himself, but is determined by how far the interaction between himself and the environment. Each individual is caused by the situation highly complex behaviors, values and variables situational complicated, such as social pressure, choices actual behavior, social events, and attitudes conflicting, often causes people to act in violation, the choices attitude. The totality of these causes, put forward a prediction that causes individuals to behave in a bureaucracy (Thoha, 1996).

Social behavior stem from the perception is influenced by external factors (situational) and internal factors (personal). Situational factors that influence the perception, among others, is the political system, social system and economic system, while the internal factors that influence the perception is the experience, knowledge, motivation, and personality (Darsono, 2010).

Behavior bureaucratic leaders must be professional in providing services to the public. Because at the moment the most bureaucratic leader behavior is expected professional behavior in providing public services, which in turn will increase his devotion to the community. Therefore, there are four key bureaucratic leader behaviors that can be developed towards professionalism, namely: (1) The behavior of the leader of bureaucracy closer to the people with the basic attitude to serve and not be served; (2) The behavior of the bureaucracy leader in improving the quality of services in accordance with the demands of society are constantly evolving through the quality control methods; (3) The behavior of the bureaucracy leader in realizing the mechanism of planning, program budgets with more listening and absorbing the aspirations of the community, either as an object or as a subject in the implementation of development; (4) The behavior of bureaucracy leader in realizing the downsizing and realignment to better public services (Thoha, 1996).

In all other cases the group's behavior and interpersonal influence also provide power for the performance of the organization. The group was formed because the act of intentionally and unintentionally by management and also by individuals. Formal group is a group formed by the Management to carry out a job and tasks. While the informal group is a group formed unintentionally by management to support the achievement of a task. Informal groups can also be formed based on individual initiative because of common interests, hobbies, and based on friendship.

Both types of these groups has a significant influence on organizational performance. Even the informal group has influence unit, not seen but felt. In connection with affiliated so that the existence of this informal group is indispensable. Even if you have management provide facilities for the growth and development of this informal group, and then be directed to support the achievement of organizational goals (Wahjono, 2010).

In the state bureaucracy, awards to employees who work as well as be efficient, creative, and responsive is still very limited. The bureaucratic officials often do not recognize the concept of "customer" because customer often do not have the ability to provide sanctions to officials of the bureaucracy. At the same time the fate of the official bureaucracy by customer or users of goods and services produced by a bureaucracy but a political decision. Therefore, the bureaucratic officials often feel no interest in a relationship with the community of users.

All that led to the ethics of the waiter became difficult to develop within the public bureaucracy. The bureaucratic apparatus was difficult to do, when asked to say hello to the user community, with greetings and asking his need with friendly. This occurs because the system of values that was never taught them that their existence is as a public servant should serve the citizens and polite. Preferably the values that exist in the bureaucracy, even though sometimes outside bureaucracy, teach them that they are rulers or officials who have looked authoritative before the citizens.

Culture government bureaucracy is always oriented to power. Power becomes tensile values that are important to the members of the bureaucracy. This is understandable because a lot of things to be desired by bureaucratic officials are always associated with power. During this time all the desired bureaucratic officials as income, influence, facilities, privileges, and so is always associated with the power they have. Even this motivation led to more bureaucracy oriented officials to seek and maintain power rather than serving citizens (Dwiyanto, 2006).

2. Dimensions of Quality of Public Services

Osborne, David and Ted Gabler (1992), About Reinventing Government, can be summarized in ten constellation (scientific statement) which is used as principles in running the administration of the State, among others: (1) Steering rather than rowing, the government acts as a catalyst, which does not need to implement own development but enough to control resources in the community. The government's role is to optimize the use of funds and power according to the public interest; (2) Empower Reviews their own community to solve problems,
rather than Merely deliver service. The government plays a role in the delivery of services to empower people so that needs to be done is to encourage people to be able to solve their own problems. Such capabilities can be reflected on the role of NGO and semi-government agencies (Cooperative) to solve the problem with its ability, for example: the cleanliness of the environment, the needs of schools, residential health etc; (3) Promote and encourage competition rather than monopolies. With the competition, the private business sector and the government to compete, and forced to work in a more professional and efficient; (4) Be driven mission rather than rules. The government should undertake activities that emphasize the achievement of what is its mission rather than emphasizing the regulations. Therefore leeway to produce something be necessary; (5) Result oriented by funding outcomes rather than outputs. Orientation on good performance (meaning external performance) is not merely a perceived internal output; (6) Meet the need of the customer rather Reviews those of the bureaucracy. Giving priority to meeting the needs of consumers (the public as a user) and not meeting the needs of the bureaucracy; (7) Concentrate on earning money rather than just spending it. The government should have personnel who know the right way to produce a receipt for the organization and ability to stay on budget, rather than spending budgets; (8) Invest in Preventing the problem rather than curing crises. The government is anticipatory, it is better to prevent than to cope. Better to prevent disease than to cure. Thus there will be mental switch in the government apparatus; (9) Decentralize hierarchical authority rather than build. Decentralization is needed in the system of government to be able to raise the participation and the development of teamwork. Pushing subordinate organizations will be free to be creative and take the necessary initiatives; (10) Solve the problem by Influencing market force rather than by treating public programs. The government must pay attention to market forces. Supplies based on need or market demand, and not vice versa (subsidy). Therefore, the policy should be based on market needs.

Banishing bureaucracy, it can be seen from the opinion that the core contains five strategies to implement reinventing government, namely: (1) The core strategy (core strategy). Restructure the organization is clear about the purpose, role and direction of the organization, (2) Consequence strategy. The strategy encourages "healthy competition" in order to improve the motivation and performance of employees, through reward and punishment taking into account the economic risks and awards, (3) Consumer strategy. Focusing on the customer is responsible for. Organizations must win the competition and give assurance to customers, (4) Control strategy. Changing the location of forms of control within the organization. Control is transferred to the bottom layer is the implementing organization or society, organizations control shaped by the vision and mission that has been determined. Thus there is a process of empowerment organization, employees and the community, (5) Cultural strategy. Changing the work culture of the organization that is composed of elements of habits, emotions and psychology, so that the public's view of the culture of public organizations have changed (no longer look down on people who are supposed to be served).

Based on the opinion and Denhart. Denhart can be said that the government as a provider of public services with the capacity to be fighting for the highest possible quality of services, and public organizations to do so as soon as possible, but also consider the legal restrictions and accountability. Efforts to improve the quality of service to begin by acknowledging the differences of customers and citizens. Citizens are described as bearer of rights and obligations in the context of the wider community. Opinion Denhart is clearly that the public service is different from the services provided by private organizations which have the discretion in the actualization entrepreneurship her for the manager, but it means not forbid to practice the spirit of entrepreneurship in public organizations and in respect employee can not be equated with private organizations. Peters (1996) concurred with Denhart that "fundamentally, this approach (participative) assumes that individuals are motivational in their organizational and political lives by solidarity- participation incentives rather than by material - pay and perquisites -incentives".

Furthermore, to realize the concept of NPS in these areas need to pay attention to the actualization of the quality of services as follows:

a. Democracy and empowerment

Her life of democracy in a country is reflected by the recognition and respect for the country and the entire state apparatus of the rights and obligations of citizens, including the freedom to make choices and express them selves rationally as the form of a responsibility in the implementation of state and nation building, and empowerment for them which is in a weak position in a rational and fair. Democracy does not only have meaning and contain freedom, but also responsibility, and democracy also contain demands that meaningful wisdom in taking responsibility in achieving a common goal that made civilized, with a high commitment to uphold the public interest by upholding the values of humanity, justice and truth.

In order to empower communities to take charge of government's role can be reinventing between other through (a) the reduction of barriers and obstacles to creativity and participation society, (b) expansion of access services to support various social and economic activities of society, and (c) development program to further enhance the capabilities and allowing the public more active role in harnessing and utilizing productive resources available so that it has a high added value in order to improve their welfare.

b. Service

Empowerment requires a passion for serving the community (a spirit of public services) and become a community partner (partner of Society) or working with the community (coproduction or partnership). It requires a change of behavior among other things can be done through the civilizing code of ethics ("code of ethical conducts") which is based on the support of the environment (enabling strategy), which translates to a standard of behavior that is generally accepted and used as a reference the behavior of the government apparatus either as well as centered in these areas.

Services also means spirit of service that prioritizes efficiency and success of the nation in the building, which is
manifested among other things in serving behavior and not be served, encourage, not hamper, simplify, not complicate, simple and not complicated, open to everyone, not just for a handful person. Meaning of public administration as a vehicle for administration of the country, the essence, serve the public, must be completely internalized the organizers state government both central and local.

c. Transparency
In the execution of its duties and functions in addition to adhere to the code of conduct, apparatus and system management public should develop openness and accountability system, to be open and accountable to encourage the leaders and all the human resources in it play a role in the practice and instituted a code of conduct in question, in order to make themselves as a role model of society, and it was done as part of the responsibility and accountability to the community and the state.

Empowerment to people's businesses, increased participation and partnerships, in addition to requiring disclosure of government bureaucracy, also requires measures firmly in reducing regulations and procedures that inhibit creativity and activity and their activities, as well as the member the opportunity for the public to be able to participate in the process the regulation of wisdom implementation and monitoring of development. Empowerment and openness will promote accountability in the utilization of resources and their development decisions are really directed in accordance with the priorities and needs of the community, as well as carried out in real terms fair and appropriate aspirations and interests of the community.

d. Participation
Communities being involved in the process of producing public goods and services by developing a partnership and togetherness, and not solely served. For that community capabilities must be strengthened ( "empowering rather than serving"), should increase public confidence, and the public the opportunity to participate enhanced.

Formulation empowerment (empowerment) also always associated with participation and partnership approach in management development, and emphasis on decentralized decision-making process in order to obtain the expected results with the most effective and efficient in the execution of development. In this connection, it is worth noting the important role of community self-reliance, and emphasized that the focus of true development is to increase individual and institutional capacity ( "capacity building"). Do not ignore it disseminated information on the potential and development opportunities of national, regional, and global open to local and privatization in management state businesses.

e. Partnerships
In an effort to develop a partnership that is mutually beneficial business between large enterprises, medium and small businesses, the role of government directed towards harmonious growth. The government role in creating climate operations and business environment, through various policies and the legislation that encourages partnership scale large business, medium, and small businesses in the production and marketing of goods and services, and in various economic activities and other developments, as well as integration small businesses into the modern sector in the national economy, and encourage growth process, and in the process mentioned their legal certainty is needed.

f. Decentralization
The changes in all fields of development requires decision-making and service are not centralized, but dispersed in accordance with the functions, powers, and responsibilities that area. Because of the construction is essentially implemented in the area-in the area various authorities that have been handled by government center has been transferred to local governments. Similar measures have to be followed by organizations, businesses, especially large companies headquartered in Jakarta, so that business decision-making as well as fast do in the area.

Developmental differences between regions have implication different in kind and intensity of the role of government, but in general the community and business requires (a) decentralization in granting permits, and the efficiency of bureaucratic services for the activities of the world in the field of social economy, (b) the adjustment of tax policy and lending more real for development in regions lagging and system financial balance between the center and regions in accordance with the contribution and potential of regional development, and (c) the availability and ease of getting information on potential and business opportunities in the region and in other regions to regions in an effort to increase development area.

g. Policy consistency and legal certainty
Rule of law that justice is effectively the government services embodied feels very difficult, but absolutely necessary in the implementation of good governance and clean, precisely in the middle of the plurality of rampant corruption, including money politics, numerous uncertainties environmental developments, and the intensification of competition.

The quality of public services can be seen as one of the performance of public organizations. Keban (2004, in the context of the new public management, performance assessment should be seen as an effort sustainable in order to improve the performance of public organizations. Basic performance assessment is not solely on the process adopted, the treatment of subordinates or to the community and how accountability runs in the organization, but, more broadly, namely with regard to quality of service, connection with the mission and vision or values championed the organization, suitability what the public organization with the aspirations and needs of the people or users, and to what extent a public organization has to learn to solve problems and improve the situation. Thus, the challenge for public organizations is to draw up programs, direct the behavior of employees, and directing resources to produce the performance of the organization in accordance with the expectations of the user community. Strictly speaking, people's expectations of the public organization is an inspirational source in management of public organizations so that performance can qualify for a quality service. If there are complaints from the public against the public service and it will be necessary input on the transformation process in public organizations.
Implementation of the functions of government providing public services course must have quality. The quality of public services in democratic governance oriented to the public is based on public expectations regarding the service, which means a good quality of service providers not based on perception but from a perspective or customer perception. The identification of customers / stakeholders with regard to those who are directly or indirectly engaging the services of public services or those who are directly or indirectly affected by the policies of public organizations. Stakeholder is any person or group concerned with the level of performance or the suitability of a public organization, program or sub program. They may only be advisory or referrals to public organizations, because it has an interest with the level of performance or suitability of public organizations.

Since the 1980s the government experts have stated: "sounded the alarm by identifying the lack of a consistent models of frame work for managing service as the reason most often cited for customer dissatisfaction". The warning is to alert the public administrator that if the skeleton model framework for managing the service has met the expectations of society, the reality model of the existing framework have been complaints by the people. Model framework as a guideline for government officials to transform inputs into outputs, and in the process will use a particular work process. In general, all products are manufactured and delivered to customers through a work process or business process. A work process can be defined as sequential integration of people, materials, methods, and machinery or equipment, in an environment in order to produce value-added output for the customer. The working process of converting inputs into outputs measured through sequential steps are organized.

Indonesia as a developing country that is heading to the industrialized countries need to build a modern quality system and an integrated quality management practices in various areas of life as a weapon to win competence in the global market. Integrated quality management or total quality management (TQM) is a benchmark of excellence in organizational management.

The concept of quality as the ability of a product or service meets the customer's needs. It also said the quality as the totality of views and characteristics of the products or services that strive with all our ability to satisfy specific needs. Quality of service can be viewed from two angles, namely manufacturers and customers or markets. If a review of a market perspective, the assessment of the quality delivered to users, namely the extent to which the design of services implemented by organizations capable of meeting the needs of customers (quality of design). Customers see the quality of the characteristics that should he accept to include value (value), fitness for use (suitable for use), support (support), and psychological impressions (impression psychological), all of which are perceived as dynamic. Meaning the quality of the customer is obtained from the comparison between the expectations of the ministry (expected service) and an assessment of the reality of care received (perceived service). While, from the point of manufacturers or providers of products or services, the quality of the views of the fulfillment of the specifications or attributes that have been required and otherwise, including provisions for costs that are the responsibility of the user. Fostering better management and utilization of organizational resources geared to meet the requirements that have been declared, compliance with the aim to meet the expectations of users to obtain satisfaction. Needs required can be either the product itself or the process of interaction between citizens and government bureaucratic apparatus (delivery), as alacrity in accepting the petition, decency, commitment to the promise of the settlement, and so on. The result is that organizations are not only focusing on the transformation, but also improve the quality of employees whole, ie employees in direct contact with service delivery. Russell and Taylor simplified view of the image as follows:

Ibrahim (2008) explains there are five discrepancy in administrative services as follows: The first gap, can occur because of lack of doing a survey / study of the needs of the market / society, or because they are not used the results of research conducted and less interaction between the service provider with the community; The second gap, can occur because they lack the commitment management / administration in efforts to achieve the quality of service, less precise perception of the quality of service that customers want / community; The third gap, occurs because the conflicting roles of the providers of care, whether satisfaction or the wider community leaders, personnel incompetent, even later than the mastery of technology or not in accordance with the demands of the service, not specifically implementation of reward and punishment system, or even non-existent; Gaps fourth, occurred because of poor horizontal communication among service personnel, so that the service runs haltingly; Gaps fifth, occurred because the gap between expectations and the actual services received, which is an accumulation of organizational performance services.

Normatively, Indonesian government has tried to encourage their public service quality with the giving of service standards as a guarantee of certainty for the recipient of the service. The standard of service is a measure which is directed to standardization in the implementation of public service that must be adhered to by users, public organizations. This can be seen from the Presidential Instruction No. 1 of 1995 on Improving Service Quality Government Personnel Community, and followed up with the Minister for Administrative Apparatur State number 81 of 1995, which confirms that a quality service should be in accordance with the joints of simplicity, clarity and certainty, security, openness, efficiency, equal justice, and timeliness. Ministry of Interior has issued a policy in the form of Minister of the Interior Circular number 100/757 / OTDA / 2002 on minimum service standards (SPM), which must be met by District / City in the provision of public service. SPM in basic services is necessary for local governments and citizens as recipients of services. For local government may be used as a benchmark in determining the specifications of the characteristics necessary services, while for the community can be used as a measure of the quantity and quality of public services provided by local governments. Therefore the aim of SPM is to guarantee a minimum quality of a public service provided by the government to the public.

IV. CONCLUSION
Basically this paper is expected to embody the concepts to know the dimensions of the behavior and the quality of public services contained in the concept of the New Public Service (NPS), which are directly related to the quality of services contained in public organizations in order to achieve efficiency, effective, economical, fair, and responsiveness to service the needs of the community.

Efficient is the activity of the service provided by searching the best comparison between input issued by the output (result) services. Second opinions basically have the same intention that the efficiency is the result of a comparison between the output to the input of the best. An activity or program of an organization said to be efficient if it is able to produce a specific output with inputs as low, or with specific input capable of producing maximum output. If employees are trying to seek a ratio in the use of organizational resources (time, materials, equipment, energy and mind) to produce the kind of greater service and better efficiency will be obtained.

Equity (fairness) and fairness (fairness) at first glance appear to be different, but if you be more in mind that the reasonableness of the moral spirit of public officials to treat equally to citizens when it meets an importance. "Fairness is taken here to a mean a more equal distribution of opportunities, cost, and benefits in the social and political domain". In the compound theory of social equity, the terms of fairness, justice, and equality are used interchangeably. Thus, the dimensions of service quality of public organizations proposed by Frederickson is efficient, economic, effective, fair, and responsive.

The economic dimension in terms of services related to the primary management of financial resources (money / cash) into the secondary input in the form of labor, materials, and the infrastructure used for the organization's operations. The economic dimension beyond human resources can be seen from the efforts of employees or organizations to obtain better materials and more with the available budget. The economic dimension in terms of labor has the sense that the organization should have the staff who have the competence, skills, and motivation in accordance with the expectations associated with his salary. Thus, the economic dimension in the concept of service quality can be seen from the organization's ability to get quality materials with the available budget and to obtain and retain competent employees.

The content of the effective meaning in the work of public services is the achievement of specific results as required by his position through specific actions to consider or consistent with the policies, procedures, and environmental organizations. Accordingly, officials of public organizations in providing services should understand the needs and desires of the community / applicant by utilizing the policies, procedures and adapted to the conditions. Effectiveness can be seen from the efforts of the apparatus for the fulfillment of the promise that has been declared, the accuracy of the completion of the request based on the mechanisms and rules of the organization, affordability program in meeting the target.

Justice is the scope or range of activities and services provided by government organizations that are cultivated widely as possible with the equitable distribution and treatment are the same. The main social institutions is meant is the political constitution and rules of economic and social staple. By basing such understanding, fair in licensing services for example, must contain five things, namely (1) Equality in the enjoyment of those rights in accordance with the existing mechanism. In this regard, the mechanism adopted is the first come first serve, (2) The equality of treatment in the settlement of the problem, (3) Equality in fulfillment of the obligation to comply with the requirements or rules in applying for licensing, (4) The imposition of fees and sanctions proportionally based on the same economic capacity of the applicant.

Responsiveness is the ability of government organizations and members to recognize the aspirations and needs of the community. If the organization is working to serve the community, then responsiveness refers to the speed of the apparatus of public organizations in responding to and resolving problems encountered by users or citizens. Thus, the responsiveness is the willingness of public organizations and apparatus for making program and act in response to the expectations, desires, and aspirations and demands of user services / applicant to maintain and improve the quality of services and processes will be available to be viewed and assessed again by citizens . Responsiveness can be seen from the velocity of employees in response to the difficulties or problems faced by the applicant permitting, the willingness of officials to provide an alternative in solving problems of the applicant with the basic rules and ethics, convenience of the applicant to obtain the necessary information, the alertness of personnel in giving a correction / rectification on services caused any mistake or error, the willingness to accept criticism from the applicant permitting.

Public organizations in operation providing and delivering services must reflect the values and norms as a line toward the normative, ie, attention to work efficiently and effectively in distributing and delivering goods and services, respecting the rights of the population and the adequacy of governance processes are studied carefully directed against the government's relationship with citizens, appreciate the discretionary execution and representation. So the quality of public services is determined by a unique combination of political, cultural, and economic conditions in the life of society. In relation to the services provided by public organizations. Basically, the public services is seen as a mandatory dividend distributed to the people by the government with the better, more accessible and more equitable. Pressure on aspects of speed, accuracy, convenience, and fairness in public services (civil) is related to the monopoly nature of the service (civil) society did not have the option to expect the same services at other institutions outside government

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Assessment of Nurses' Knowledge for Children with Burns Injuries attending Burns Specialist Hospital in Baghdad City

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Abstract- Objective(s): Identify nurses' the relationships between nurse's demographic characteristics like (age, gender, level of education, years of experience in burn units, monthly income, course of training in burns) and their knowledge provided for children with burn injuries attending burns specialist hospital in Baghdad city.

Methodology: A quasi-experimental study design was carried out at the non Teaching Hospital in Baghdad City from June 1st of 2016 up to the 30th of June 2017.

Non probability (purposive) sample of (46) nurses were selected from burns wards in non Teaching Hospital in Baghdad City, and they have at one year of experience in burn units of the Hospital.

The study instruments consisted of two major parts was constructed for the purpose of the study. First part related to nurse's demographic data, the second part related to nurse's knowledge which composed of (40) items of nurses' knowledge of child's with burns at burn units.

The data and were collected by using of constructed questionnaire, which consisted of (40) items self administrated method used and filled by using the questionnaire. Select the stability of the questionnaire during and select the pilot study through a group of 16 experts. Been described of data analyzed through using of two statistical approaches: descriptive statistical analysis and inferential statistical analysis.

Results: The study results revealed table shows that the study group nurses' knowledge at the pre-test is fail, while at the post-test one and their knowledge is changes and they become more knowledge able.

Moreover, the findings reflect that no significant relationship between nurse's knowledge and their age, gender, monthly income, training sessions, number of training sessions and place of training.

Recommendation: The study recommended that an educational by providing educational posters, guidelines, pamphlets and manuals, and training program of burns care one. Important for the nurses working in burns wards, developing of follow up child's with burns and the nurses' education level should be improved through an increasing the number of professional nurses employed in burns wards.

Index Terms- Assessment, Nurses' Knowledge, Children, Burns Injuries

I. INTRODUCTION

The normal skin consists of two layers the dermis, which forms the main bulk of the skin, consists of a layer of connective tissue composed of an interfacing network of collagen and elastic fibers that is responsible for the strength and elasticity of the skin. The dermis also contains blood and lymphatic vessels, nerves, sensory receptors, sweat and sebaceous glands and hair follicles. The dermis is thicker in certain areas such as palms, soles and dorsal aspects of the body and it is very thin in the eyelids, scrotum and penis. Beneath the dermis is the subcutaneous fat that separates the dermis from the underlying structures (1).

The burn team finds out whether or not the patient needs help with breathing or any other aspects of staying alive. One or more intravenous (IV) access lines are started so that important fluids can be given to the patient as needed. Through these IV lines, the patient is quickly given pain or other medications to make them more comfortable, and provide extra fluid so the patient doesn’t go in to "shock". Burn injuries cause the body to release chemicals into the good, so that fluids leak out of the blood vessels and into the lungs and areas around the burn. Over the first few hours, and maybe even days to weeks, this makes the patients look swollen or puffy, and at means that extra fluids must have given to keep up with their needs. After several days to weeks, this will stop happening, the fluids will go back into the bloodstream (2).

It lacks blood vessels and has few nerve endings. The bottom layer of the epidermis is called the basal layer where cells continually divide and move up through the epidermis to replace the old dead cells that fall off the skin surface. The dermis is much thicker than the epidermis. It contains blood vessels, nerves, lymph vessels, hair follicles, and sweat glands. It is held together by a protein called collagen. The subcutaneous layer is a connective tissue layer at the base of the skin. Consisting mostly of fat, it carries major blood vessels and nerves to the overlying skin (3).

Stated that nursing care is provided for people with widely diverse health and sick care needs in multiple contexts worldwide. The knowledge and competence to meet such a wide variety of care needs may be daunting for the student starting a programmer of study to become a registered nurse. Nursing programmers are designed to allow knowledge and Knowledge experience to be accumulated and assimilated by the nursing student within the 3 or 4 year course period. (4)

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Optimal care of the burn patient requires a distinctive multidisciplinary approach. Positive patient outcomes are dependent on the composition of the burn care team and close collaboration among its members. At the center of this team is the burn nurse, the coordinator of all patient care activities. The complexity and multisystem involvement of the burn patient demand that the burn nurse possess a broad-based knowledge of multisystem organ failure, critical care techniques, diagnostic studies and rehabilitative and psychosocial skills (5). The burns are a common cause of preventable injury, affecting over 1 million people in the United States, leading to the hospitalization of almost 40,000 children each year and over 1000 deaths. Half of burn injuries are in children under the age of 4 years. Although children are often burned by contact with hot liquids, household appliances, sun exposure, etc, and scalding burns are the most common burn injury in younger children (2).

The moderate and severe burn injured patients are in the high risk category for pressure area development according to the Braden scoring protocol; as they have reduced levels of mobility and skin integrity is compromised. Therefore, the pressure area prevention and treatment of burn wound and management (3).

The burn injury is the most devastating injury because the young skin of a child tends to burn more quickly and deeply than adult skin, and at lower temperatures. Moreover, the child has endured a number of painful surgical procedures over an extended period of time. Even though advances have been made in techniques to improve care management, expediting the child’s physical recovery from deep partial and full-thickness burns, and the emotional and the physical scarring of the child last a lifetime. The economic impact is huge on the family and the community. Optimal first aid management and initial resuscitation of the patient with a severe burn injury are most with the nurse (7).

There are many burns patients need to undergo cleaning and debridement, which involves removing devitalized tissue around the wound, and this should only be done by a health care professional (2).

The situation in Iraq published data regarding burns in Iraq including Kurdistan are scarce. The WHO estimates that there were 3, 390 fire-related deaths in 2004 in Iraq which is equivalent to a death rate of 12.3 per 100,000 per year, which is higher than the global rate (8). Therefore, highlights Annual death rate from burns in the pediatric population in Colombia was 0.901 per 100,000. Fire is the principal cause of burn deaths in Colombia, followed by electrical burns. The average annual percent mortality change for burn deaths was 5.17%. Children under 5 years of age account for the highest mortality rates (11).

Methodology: This chapter deals with methods which are used in the study design, administrative arrangements; setting of the study, the population and sample of the study, instrument construction, methods of data collection, pilot study and data analysis.

Administrative Arrangement: An official permission is obtained from the Ministry of Planning Central Council of Statistics for the acceptance of the draft of the instrument. Another approval is issued from the Ministry of Health Baghdad city non Teaching Hospital and initial agreement of one non Teaching Hospital in Baghdad city in order to carry out the study and finally subject agreement is also obtained from the nursing staff, in burn units and, him/her self to participant The participant were asked to answer within takes approximately (25-35) minutes the questionnaire and finally participant agreement is granted.

Design of the Study: A quasi-experimental design evaluation of the study is conducted at Baghdad non Teaching Hospitals. The study is carried out to determine the nurses knowledge toward children with burns injuries in burn units and centers in Baghdad City non Teaching Hospitals from June 1st 2016 to the 30th June 2017.
**Setting of the Study:** The study is carried out at Baghdad city non Teaching Hospitals as being divided into one hospital according to the Ministry of Health. A total of (2) burn units is selected for the purpose of the study. This hospital had included the prince Specialist Burns Hospital were in the AL- Russafa side this hospital non Teaching Hospital in Baghdad city,

**Instruments:** Through an extensive review of literature, instruments is constructed for the purpose of study. By the researcher according to the burn units and nursing care to measure the underlying concepts in the present study the questionnaire. It is composed of parts and overall items, which are included in these, are (40) items

All these items have been measured, scored and rated two levels liker scale which are indicated by score (2) for right answer, score (1) for the wrong answer.

**Data Collection:** Data are collected by utilization of the developed questionnaire tool. The investigator collected the subject's responses through the questionnaire sheet self-administrated self-report and structured interview technique are used for nurses'. The participant was asked to answer within takes approximately (25-35) minutes. The data collection is carried out from June 1th 2016 to the 30th June 2017.

In order to achieve the early stated objectives, the data of the study were analyzed through the use of statistical package of social sciences (SPSS) version 18 through descriptive and inferential statistical analysis

**Table (1) Assessment of study Group Nurses’ Knowledge (pre-test, post-test one)**

<table>
<thead>
<tr>
<th>Items</th>
<th>Pre-test</th>
<th>M.S</th>
<th>S.D</th>
<th>Assessment</th>
<th>Post-test</th>
<th>M.S</th>
<th>S.D</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Burns defined as</td>
<td>1.70</td>
<td>0.47</td>
<td></td>
<td>Pass</td>
<td>1.83</td>
<td>0.39</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>2. The most important functions of the skin :</td>
<td>1.26</td>
<td>0.45</td>
<td></td>
<td>Fail</td>
<td>1.87</td>
<td>0.34</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>3. The skin is made of several layers</td>
<td>1.39</td>
<td>0.50</td>
<td></td>
<td>Fail</td>
<td>1.70</td>
<td>0.47</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>4. Located of the sweat glands and hair follicles in the skin layer</td>
<td>1.13</td>
<td>0.34</td>
<td></td>
<td>Fail</td>
<td>1.74</td>
<td>0.45</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>5. Be spirometry (regularity, depth) by stethoscope</td>
<td>1.39</td>
<td>0.50</td>
<td></td>
<td>Fail</td>
<td>1.83</td>
<td>0.39</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>6. The suffering caused by burns in children after healing</td>
<td>1.22</td>
<td>0.42</td>
<td></td>
<td>Fail</td>
<td>1.91</td>
<td>0.29</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>7. To controls the infection (Infection) and prevents infections through</td>
<td>1.39</td>
<td>0.50</td>
<td></td>
<td>Fail</td>
<td>1.74</td>
<td>0.45</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>8. Important tests for children burns</td>
<td>1.17</td>
<td>0.39</td>
<td></td>
<td>Fail</td>
<td>1.96</td>
<td>0.21</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>9. The burns are classified into</td>
<td>1.87</td>
<td>0.34</td>
<td></td>
<td>Pass</td>
<td>1.52</td>
<td>0.51</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>10. The necessary things of which are taken into consideration in feeding children suffering from burns, accidents include</td>
<td>1.09</td>
<td>0.29</td>
<td></td>
<td>Fail</td>
<td>1.83</td>
<td>0.39</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>11. Be liquids account for children with burns according to the following equation</td>
<td>1.22</td>
<td>0.42</td>
<td></td>
<td>Fail</td>
<td>1.57</td>
<td>0.51</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>12. The signs of chemical burns that occur on the respiratory system are</td>
<td>1.30</td>
<td>0.47</td>
<td></td>
<td>Fail</td>
<td>1.83</td>
<td>0.39</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>13. Divides given of fluids during the first 24 hours for children with burns as</td>
<td>1.13</td>
<td>0.34</td>
<td></td>
<td>Fail</td>
<td>1.70</td>
<td>0.47</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>14. The types of ionizing radiation that causes burns are</td>
<td>1.61</td>
<td>0.50</td>
<td></td>
<td>Pass</td>
<td>1.87</td>
<td>0.34</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>15. The initial evaluation of the child with burns by observing the following</td>
<td>1.35</td>
<td>0.49</td>
<td></td>
<td>Fail</td>
<td>1.43</td>
<td>0.51</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>16. The initial assessment is the circulatory system during the period of</td>
<td>1.13</td>
<td>0.34</td>
<td></td>
<td>Fail</td>
<td>1.87</td>
<td>0.34</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>17. Be a preliminary assessment of the severity of the burn for the children to use</td>
<td>1.17</td>
<td>0.39</td>
<td></td>
<td>Fail</td>
<td>1.57</td>
<td>0.51</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>18. Increase the seriousness of the burns in the event of delay in the processing</td>
<td>1.22</td>
<td>0.42</td>
<td></td>
<td>Fail</td>
<td>1.91</td>
<td>0.29</td>
<td></td>
<td>Pass</td>
</tr>
<tr>
<td>19. Criteria of the admission in to the burns units and centers include</td>
<td>1.35</td>
<td>0.49</td>
<td></td>
<td>Fail</td>
<td>1.87</td>
<td>0.34</td>
<td></td>
<td>Pass</td>
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<td></td>
<td>Be evaluated case by burning intensity (Severity) include</td>
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<tr>
<td>20</td>
<td>1.30 0.47 Fail</td>
<td>1.78 0.42 Pass</td>
<td></td>
<td></td>
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<tr>
<td>21</td>
<td>1.22 0.42 Fail</td>
<td>1.87 0.34 Pass</td>
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<tr>
<td>22</td>
<td>1.04 0.21 Fail</td>
<td>1.83 0.39 Pass</td>
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<tr>
<td>23</td>
<td>1.09 0.29 Fail</td>
<td>1.74 0.45 Pass</td>
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<tr>
<td>24</td>
<td>1.43 0.51 Fail</td>
<td>1.57 0.51 Pass</td>
<td></td>
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<tr>
<td>25</td>
<td>The organs members that fall under the third layer of the skin</td>
<td>1.30 0.47 Fail</td>
<td>1.78 0.42 Pass</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>26</td>
<td>The shock occur in cases of burns because</td>
<td>1.26 0.45 Fail</td>
<td>1.91 0.29 Pass</td>
<td></td>
<td></td>
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<tr>
<td>27</td>
<td>Thermal burn occurs when the skin is exposed to the extent that the amount of heat</td>
<td>1.78 0.42 Pass</td>
<td>1.74 0.45 Pass</td>
<td></td>
<td></td>
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<tr>
<td>28</td>
<td>The burns severity depends on several factors such as</td>
<td>1.39 0.50 Fail</td>
<td>1.83 0.39 Pass</td>
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<tr>
<td>29</td>
<td>Ways of feeding the child with burns would be through</td>
<td>1.35 0.49 Fail</td>
<td>1.83 0.39 Pass</td>
<td></td>
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<tr>
<td>30</td>
<td>Be changing of the position of child each</td>
<td>1.30 0.47 Fail</td>
<td>1.87 0.34 Pass</td>
<td></td>
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<tr>
<td>31</td>
<td>Be measuring vital signs for children with burns include: - Blood pressure, pulse respiration Temperature and every</td>
<td>1.26 0.45 Fail</td>
<td>1.96 0.21 Pass</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>32</td>
<td>Types of burns are</td>
<td>1.91 0.29 Pass</td>
<td>1.65 0.49 Pass</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>33</td>
<td>Comprising a second layer of skin (dermis) the following</td>
<td>1.17 0.39 Fail</td>
<td>1.61 0.50 Pass</td>
<td></td>
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<tr>
<td>34</td>
<td>Be room temperature for children with burns at a temperature</td>
<td>1.17 0.39 Fail</td>
<td>1.83 0.39 Pass</td>
<td></td>
<td></td>
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<tr>
<td>35</td>
<td>Be the temperature of the water used to wash the burns</td>
<td>1.22 0.42 Fail</td>
<td>1.78 0.42 Pass</td>
<td></td>
<td></td>
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<tr>
<td>36</td>
<td>Be dependence in the evaluation of burns on the</td>
<td>1.22 0.42 Fail</td>
<td>1.83 0.39 Pass</td>
<td></td>
<td></td>
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<tr>
<td>37</td>
<td>The implementation of the (CPR) CPR for children with burns when needed and include the following action</td>
<td>1.17 0.39 Fail</td>
<td>1.83 0.39 Pass</td>
<td></td>
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<tr>
<td>38</td>
<td>Tips that provide for the child and the parents to relieve itching due to burns</td>
<td>1.30 0.47 Fail</td>
<td>1.74 0.45 Pass</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>39</td>
<td>The injuries associated with electrical burns</td>
<td>1.13 0.34 Fail</td>
<td>1.83 0.39 Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40</td>
<td>The pain evaluated for children with burns injuries</td>
<td>1.43 0.51 Fail</td>
<td>1.85 0.41 Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

n (23), SD. (standard deviation), pass (mean equal or more than 1.5), fail (mean less than 1.5)
This table shows that the nurses' knowledge at the pre-test is fail, while at the post-test one and their knowledge is pass.

Table (2): Correlation between study group post-test knowledge their demographic data
This table shows that there is a significant relationship between the nurses' Knowledge and their monthly income, number of training sessions, and place of training sessions at p-value 0.05, while there is a non-significant relationship between the nurses' knowledge and Knowledge and the remaining variables at p-value more than 0.05.

Table (3): Assessment of Overall Study Group Nurses’ Knowledge (pre-test, post-test one)

<table>
<thead>
<tr>
<th>Overall study group nurses’ Knowledge</th>
<th>Responses</th>
<th>Pre-test</th>
<th></th>
<th>Post-test One</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>%</td>
<td>Mean</td>
<td>Assessment</td>
</tr>
<tr>
<td>Fail</td>
<td>21</td>
<td>91.3</td>
<td>1.31</td>
<td>Fail</td>
</tr>
<tr>
<td>Pass</td>
<td>2</td>
<td>8.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>100</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n (23), f (frequency), % (percentage), pass (mean equal or more than 1.5), fail (mean less than 1.5)

This table shows that the overall assessment of the nurses' knowledge at pre-test is fail, while at the post-test one and post-test two the overall assessment is pass.

II. DISCUSSION

Discussion of Nursing Knowledge Scores about Care to the Child's with Burns Injuries.

The study indicated that low grades in knowledge are fore items questionnaire for standard care at pre-test : definition of burn, function of skin, layers of skin, types of burns, classification of burns, initial assessment of burns assessment of severity, signs of chemicals burns, criteria of admissions, evaluate superficial burns, evaluate entire burns, evaluate partial thickness of burns, benefits of the prepare a sterile surgical instruments for changing the dressing of child with burn, the benefits of using disinfection to sterilize the bathroom wasting between child burn and another and check the temperature degree of water used to wash the burns' child and all items of knowledge nurses knowledge at the pre-test is fail, while at the post-test one and post-test two their knowledge is pass(1).

A study mention that the avoiding infection remains a primary goal in wound care. In the acute burn units, patient is treated daily in a tank room. On the burn unit, patient have a private room, bathroom, and shower. This is an important component of care because it minimizes the possibility of cross-contamination. Once in rehabilitation, child's in wound care begins with the shower. The occupational therapist participate on the first day to evaluate the need for adaptive equipment (10).

The result mention that the surface infection can occur at any stage in healing process. Common causes include gram-negative and gram-positive bacteria. Although infection surface infection is a setback, it often is easily treated, and responds well to topical antimicrobial, bacteriostatic, and/or bactericidal therapies, including those that contain silver. It is extremely important to prevent surface area infection; daily cleansing of the patient's skin with a solution of any mild, perfume-free soap and water is acceptable for daily showering and cleansing. Removing sloughing skin cells, dried ointment, and/or drainage helps prevent bacteria from invading fragile sites. It is essential to wear gloves during burn wound care and any time there is contact with
The study which found that the majority of staff working in the studied severe burns injury unit, did not experience for burn care. In addition, it claimed that burns nurses experience lower levels of depersonalization compared with critical care nurses in which rationale was related to the patient (12).

Mention that the interesting to note that found that burns nurses in their study experienced low levels of burnout and stress, and high levels of hardness. Therefore it is evident that a correlation exists between burnout and hardness among nurses (13).

The result study shows that there is no significant association between nurses of age and their knowledge. This result agrees with result done by which indicated that there was no significant difference between nurses’ age and their knowledge (table 2) (14).

The study shows that there is no significant association between nurses' knowledge and gender (table 2) this result agreed with obtained from study by which indicated that, there is no relationship between gender and nurses' knowledge (15).

The result show that there is no significant association between monthly income and nurses' practices. This result agree with result done by their study show no statistical significant association between nurses Knowledge and at their monthly income (table 2) (16).

The finding indicated that there was no significant association between nurses' knowledge and number of training sessions (table, 3). This result was supported by study which revealed no statistical significant association between nurses knowledge and number of training sessions. The researcher reported that this may be result which lack in planning of Training sessions to achieve the Ministry of Health goals (17).

The finding indicated that there was no significant association between nurses' Knowledge and their years of experience (table2) supported this results. There finding show no difference in knowledge and practices, between staff members with difference level of experience, qualification and seniority (18).

The finding indicated that there was no significant association between nurses' knowledge and place of training sessions (table 3).This result might be due to the insufficient training sessions related to nurses’ Knowledge toward child with burns injury at burn units with the training inside or outside Iraq. The researcher reported that all nurses’ working in burn units learning from each to other ,there is no guide or international program to support their Knowledge and help them to improve them and their nursing care to the children . The finding of the study shows there was significant association with level education and nurses' knowledge about child's with burns since higher percentage of nurse's knowledge was found among nurse's primary school graduate (table 3). These results are in line with this study revealed that positive relationship between nurses' knowledge and their level of education (4).

This result agreed with study who showed that there is relationship between nurse's knowledge and level of education (19).

This result disagree with obtain from study by their study although is widely used for the prevention of infection of open skin. Hand washing, head cup and mask is essential for caregivers, patients, family and relative (11).

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This result agreed with study who showed that there is relationship between nurse's knowledge and level of education (19).

This result disagree with obtain from study by their study although is widely used for the prevention of infection of superficial and mid dermal burns, there is currently little evidence supporting its use. The evidence is inconsistent and of limited quality. One unblinded found that there was a wider variety of bacterial flora and a larger amount of bacterial growth with the use of a silicone mesh dressing compared with used a sterile technique according to nurses knowledge for this types of injuries. However, this study found no differences in the signs of infection or the amount of wound drainage in both groups. Another study comparing the same products also found no significant difference in the number of infection (20).

III. CONCLUSIONS

1. There is no significant relationship between level of nurses' education level and their knowledge for child with burn injury.
2. There was no statistical significant association between nurses' knowledge and their general information.
3. Nursing knowledge shows high grade at post test one and post test two of nurses about children with burns Injury.
4. The study found more that than half of the nurses are female (52.2%) for both groups.

IV. RECOMMENDATION

a. Policy should be initiated to proving a special educational sessions for burns care units nurses'.

b. Applying global educational standards to promote nurses' knowledge and Knowledge.

c. Providing financial status of nurses' are working on the burns care units to encouragement of them nurses'

d. Great emphasis should be directed toward the educational aspects at burns care units by providing educational posters, guidelines, pamphlets and manuals.

e. Modern educational facilitate for nursing team at burns units should be provided to enhances nurses ' knowledge and Knowledge.

f. It is necessary to initiates a burns care specialty after the graduate from nursing college and medical institutes.

j. Providing training and professional development learning opportunities through Tele health support for nurses and allied health professionals in rural and remote areas.

REFERENCES


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