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Contact Information:
Editor: editor@ijsrp.org
Website: http://www.ijsrp.org
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Impact and development of e-commerce on consumer retention due to the coronavirus disease (COVID-19) in context to developed countries

Professor Baocheng He*, Mohammad Al Masum**

* Professor at School of Economics and Management, Shaanxi University of Science and Technology. Visiting scholar at Ulster University. UK Ph. D. in Management Northwest University. Post-doctor of accounting, Xi’an Jiaotong University. Director of Shaanxi Audit Society.
** Masters in Business administration School of Economics and Management, Shaanxi University of Science and Technology.

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Abstract- The increase in COVID – 19 pandemic altered the retail industries towards electronic commerce (e-commerce). In e-commerce consumer retention is effective factor for decision making of business. The e-commerce industry is involved in collect, store and analyze of the vast range of data stated as e-commerce analytic s. With the drastic advancement in customer transaction data, retail stores leverage data analytic s for customer superior for offering mutual and unattainable benefits. Nonetheless, fulfillment of such a strategic aim requires retailers to adopt and embrace emerging e-commerce retail consumer purchase. Analytic s is technological-oriented with between strategic implications one-commerce analytics of research. Previous research also underlined the significant impact of e-commerce analytics on customer process, relationship management, customer acquisition, and retention, etc. This article concentrated on the evaluation of customer analytics and retention for consumers of e-commerce industries. The examination is based on e-commerce analytics for the evaluation of customer perspectives. Through analysis of customer perspectives with e-commerce analytics consumer retention strategies are examined. The analysis based on six goals such as increasing insight of customer, operational efficiency, business agility, transparency of operation, business performance and business trends. The data analysis is based on quantitative based primary data collection from 5 different sectors. The statistical analysis of results expressed that web or social media is key factor in highest priority area in retail organizations. The statistical analysis also expressed that the customer acquisition and retention strategies are highly influenced by thee-commerce retail consumer purchase. The findings also stated that e-commerce retail analytics provides relationship with business process and acquisition.

Index Terms- Data Analytics, Retailer, Customer, Personalized products, Digitization

I. INTRODUCTION

In recent years, COVID – 19 pandemics strongly affects the operation of business and consumer activity [1]. The spread of COVID – 19 impacts on digital transformation and organizations are examined. The impact of COVID – 19 influences on the consumer behaviour impacts on the attention of the researchers. Also, industry and survey stated that the pandemic accelerated the e-commerce trend prior to the crisis. The increase in pandemic notably influences on the perception of consumer that impacts e-commerce platform both economic and environmental terms [2]. Some researchers observed that the change in habits of consumer during pandemic exhibits variation in structural changes in the e-commerce business for both developing and developed countries. During SARS pandemic in China between 2002 – 2003 leads to global increase in online business with estimation of uncertainty for remained behavior in online
purchase. Further, in case of e-commerce business it is necessary to understand the potential role and pandemic on e-commerce post COVID – 19 [3]. Hence, it is necessary to evaluate the consumer purchasing behaviour on the e-commerce with respect to developing and developed countries.

At present, retail incorporates changes in quantitative and qualitative multitude with consideration of consumer purchasing buying behavior [1]. The consumer buying intention is based on the combination of demographics, disposable incomes, the aspiration of customers, and urbanization. With remarkable modification in the lifestyle of consumers and resultant shifts are based on habits and patterns in buying options [2]. Those changes in consumer lifestyle dramatically alter the e-commerce as per the expectations of consumers’ demand to achieve a unique experience especially in pandemic COVID -19. To withstand shift in customer demand and expectation retailers need to grip shopping behavior in multi-channel shopping [3]. So, the form must formulate, extend, and serve with different offerings. In the globalization of the economic era, customer retention needs to understand the customer expectations is considered by retail managers [4].

Additionally, the e-commerce industry is driven by innovative, dynamic, and global transformation [5]. Also, the increase in inter-formal and Intra-format retail industry express pressure over customer-centric approach for the differentiated and excellent shopping experience [6]. In this, the retailer needs to gain significant knowledge about customer preferences and expectations. Through understanding, the retailer can able to provide adequate services, promotions, and merchandise to withstand customer demands [7]. However, retailers need to grapple with the changes in the behavior of customers to withstand competitive market technology with the evolution of digital technology with innovation in mobile and proliferation of social media [8].

In the revenue stream of customers need to acquire information over a certain time. E-commerce industry needs to alter the way to cope with customers changes using formulated strategies to purchasing intention of consumers [9]. The customer was able to comparatively examine the e-commerce industries. The examination can be of store quality, prices, sales, and loyalty [10]. In this context, the estimation of buying trends is a prominent factor in e-commerce customers’ purchasing behavior analytics exhibits the impact of retail customer trends of purchase, where and how to purchase can be done based on personal preference [11]. Retailers with-e-commerce analytics comprise of terabyte processing of multiple data and historical data to improve the overall revenue.

This research intended to evaluate the relationship of consumer purchasing intention on e-commerce business. The analysis is based on examination of effort of pandemic COVID -19 during and after pandemic lockdown. Specifically, this research aimed to identify answer How did consumer purchasing behaviour during and post COVID -19 pandemic. The data for analysis is based on consideration of e-commerce consumers for purchase intention. The analysis is based on primary data collection from e-commerce consumers by using google forms. The statistical analysis is performed to evaluate the purchasing behaviour of the e-commerce consumers. This paper is organized as follows: In section I presented about overview of e-commerce followed by evaluation of related works on based on e-commerce on consumer retention in section II. In section III overall research methodology adopted in this analysis is presented. In section IV and V presented about overall illustration of results and discussion is presented. Finally, in section VI presented overall conclusion of results obtained.

II. RELATED WORKS

In recent years, retail industry has been adopted in wide range of perspectives to gain customer perception. This section provides review of literature related to customer acquisition and retention strategies for interspersed-e-commerce analytics, conceptual framework and constructs. Finally, overall review about identified research gap and justification for research are presented.

2.1 Customer Acquisition and Retention in e-commerce

Several researchers expressed that customer process is based on processes, customer acquisition and retention [19]. In marketing and operations issues related to alignment is based on acquisition and retention management. This involved in consideration of management operations and services [20]. To increases the customer profitability maintenance and growing companies success with respect to various industries. In industries, customer acquisition and retention process are significantly correlated. Researchers evaluated the modeled issues together and separately. A customer acquisition of firm concentrated on information acquired from potential customer, potential value and resource availability for long term [21]. Customer acquisition and retention are exclusive in business with consideration of different degrees [22]. In [23] stated that steady customers put pressure over firm to acquire new customers subjected to increase in cost and risk. With prospects lack of firm knowledge is considered as significant

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predictor of vendors, which causes massive high-dimensional data. The selection of appropriate variable and functional relationship is based on acquisition probabilities for sustainable issues.

Another research conducted in [24] expressed that the 59% comprises of brick and mortar for acquisition as primary objective. The main objective is obtained with 19% for retention of customer. Also, analysis expressed that the 55% of retailers are single brand and 59% of population were multi-brand customers for acquisition. Further, it is observed that a75% of marketing is based on retention of customer acquisition. It is expected that for next 3 years customer acquisition will be moving towards retention. Consequently, retailers concentrated on how to retain new customers and they are unsure about the target.

2.2 Customer Retention in e-commerce

In several industries, customer retention is growing concern to increase the profits and and sales at considerable time and resource evaluation to increase the profits and sales. The searching for resources are based on examination of new customer and retain the customer profitability. Researchers, substantially involved in customer retention and costs for acquisition of customer [25]. Retention involved in efficient relative factor for special and important about customer retention. Several companies consulting, cable service, finance and retention for long term. The orientation of customer retention concentrated on information, differentiation and resource allocation for relationship management with customers those are existing based on consideration of long-term. In retention of customer and growth marketing actions are contacts, programs of loyalty and cross-selling factors [26]. Empirical analysis expressed that marketing strategy can be through direct mail, sales and telesales those influence on retention of customer [27].

Customer perception is based on amount they buy, stay and referrals [28]. Based on this in to consideration [28] presented an impact of customers as long-tenure and referrals those comprises of customer retention strategy. However, few research expressed that customer retention are standing at higher volume with minimal customer tenure. The results expressed that weak relationship exists between customers tenure and profitability of firm. Also, it stated that retention of customer is based on customer relationship and service quality. The minimal trust plays involved in customer defection and general product features [29]. In [30] identified that customer profitability is increased with effective marketing strategies for accurate information gathering. Marketers, continually focused on effective understanding of customers.

This research concentrated on evaluation of e-commerce analytics in the retail stores. The data were collected from 5 retail stores such as apparel, food & Grocery, entertainment and consumer durable sector. The research design and data collection described are presented as follows:

### III. RESEARCH METHOD

**Research Design** - To collect data for analysis this research adopts a descriptive research design. Through descriptive research factors contribution of e-commerce on retail store is evaluated based on consideration of customer analytics and customer retention. The descriptive research design analysis is based on the consideration of the following hypothesis into consideration.

**Data collection type** - The secondary data collection is based on quantitative data analysis. The dataset is associated with a numerical value, number, or counts for the examination of numerical values. Based on the collected data analysis is performed and the conclusion is derived.

**Sampling:** This research includes primary data collection method to examine impact of e-commerce analytics on consumer retention and analytics. The sampling considered for analysis are presented as follows:

**Primary Data:** The contribution of e-commerce analytics on retail store for customer retention and analytics is performed based on primary data collection.

**Data Collection method:** To collect data form employees google form is created for collection of data. The data collection consists of questionnaire for data collection for analysis. Population: Data related toe-commerce analytics on retail store are collected from employees those are in retail manager, business analysts and IT professionals.

### IV. DATA ANALYSIS

This research intended to evaluate the contribution of e-commerce analytics on retail of customers. The data for analysis is collected by means of primary data collection from Retail managers and/or retail IT professionals familiarised and/or working withe-commerce retail consumer purchase in food and grocery, apparel, consumer...
durables and entertainment retailing in the China and Bangladesh were invited to participate in the survey through self-administered structured questionnaire as well as online (survey monkey) survey method. A total of 630 e-commerce consumers are considered. Out of which, 580 questionnaires were rendered usable and rest were found unusable due to incomplete data. This is an approximately 92 percent response rate.

4.1 Descriptive Statistics
The data collected from sample population and respondents are described in this section as follows. The demographic data collected from sample population are illustrated in table 1 with relative consistent and representative of target in e-commerce sector. The demographic analysis is based on consideration of respondent demographic profile in terms of designation, expertise, experience, age and gender.

<table>
<thead>
<tr>
<th>Description</th>
<th>Total sample n=580</th>
<th>Apparel sector n=180</th>
<th>Food &amp; Grocery sector n=155</th>
<th>Consumer durable sector n=140</th>
<th>Entertainment sector n=105</th>
<th>For χ² Value at 5% level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>445 (76.7)</td>
<td>130 (72.2)</td>
<td>120 (77.42)</td>
<td>110 (78.57)</td>
<td>df9, p&lt;0.025</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>135 (23.3)</td>
<td>50 (27.78)</td>
<td>35 (22.58)</td>
<td>30 (21.43)</td>
<td></td>
</tr>
<tr>
<td>Age in Years</td>
<td>25-35</td>
<td>120 (20.69)</td>
<td>43 (23.89)</td>
<td>35 (22.58)</td>
<td>25 (17.86)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>35-45</td>
<td>250 (43.10)</td>
<td>66 (36.67)</td>
<td>57 (36.77)</td>
<td>55 (39.29)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>45-55</td>
<td>144 (24.83)</td>
<td>45 (25.00)</td>
<td>34 (21.94)</td>
<td>40 (28.57)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>55-65</td>
<td>66 (11.38)</td>
<td>26 (14.44)</td>
<td>29 (18.71)</td>
<td>20 (14.29)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td>Marital Status</td>
<td>Married</td>
<td>493 (85.00)</td>
<td>153 (85.00)</td>
<td>131 (84.52)</td>
<td>119 (85.00)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Unmarried</td>
<td>87 (15.00)</td>
<td>27 (15.00)</td>
<td>76 (49.03)</td>
<td>21 (15.00)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td>Education</td>
<td>Degree</td>
<td>377 (65.00)</td>
<td>177 (66.11)</td>
<td>101 (65.16)</td>
<td>91 (66.43)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>PG &amp; above</td>
<td>203(35.00)</td>
<td>63 (16.1)</td>
<td>54 (34.84)</td>
<td>49 (33.57)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td>Designation</td>
<td>Top/Admn</td>
<td>290(50.00)</td>
<td>91 (50.56)</td>
<td>78 (50.32)</td>
<td>72(51.43)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Middle/Exec</td>
<td>232 (40.00)</td>
<td>73 (40.56)</td>
<td>62 (40.00)</td>
<td>53 (37.86)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Lower level</td>
<td>29 (5.00)</td>
<td>9 (5.00)</td>
<td>7 (4.52)</td>
<td>8 (5.71)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Operative</td>
<td>29 (5.00)</td>
<td>7 (3.89)</td>
<td>8 (5.16)</td>
<td>7 (5.00)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td>Expertise</td>
<td>CRM</td>
<td>203 (35.00)</td>
<td>63 (35.46)</td>
<td>54 (34.84)</td>
<td>51 (36.43)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>L SCM</td>
<td>116 (20.00)</td>
<td>36 (20.00)</td>
<td>31 (20.00)</td>
<td>28 (20.00)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>ICT</td>
<td>116 (20.00)</td>
<td>36 (19.44)</td>
<td>31 (20.00)</td>
<td>29 (20.71)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>Merchandising</td>
<td>87 (15.00)</td>
<td>28 (15.56)</td>
<td>23 (14.84)</td>
<td>20 (14.29)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>RCOM</td>
<td>58 (10.00)</td>
<td>18 (9.44)</td>
<td>16 (10.32)</td>
<td>12(8.57)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td>Experience</td>
<td>&lt; 5 years</td>
<td>59 (10.17)</td>
<td>19 (10.56)</td>
<td>15 (9.68)</td>
<td>15 (10.71)</td>
<td>df9, p&lt;0.025</td>
</tr>
<tr>
<td></td>
<td>5-10</td>
<td>116 (20.00)</td>
<td>35 (19.44)</td>
<td>31(20.00)</td>
<td>29 (20.71)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>10-15</td>
<td>174 (30.00)</td>
<td>53 (29.44)</td>
<td>47 (30.32)</td>
<td>42 (30.00)</td>
<td>df3, p&gt;0.05</td>
</tr>
<tr>
<td></td>
<td>&gt;15 years</td>
<td>231 (39.83)</td>
<td>73 (40.56)</td>
<td>62 (40.00)</td>
<td>54(38.57)</td>
<td>df3, p&gt;0.05</td>
</tr>
</tbody>
</table>

Source: Primary data
Note: Values given in parenthesis are calculated in percentage of their column totals.

All the respondents were retail managers, IT professionals and business analysts consisted of 445 male (56.7%) and 135 female (23.3%) with an average age of 37 years (range 25-65). Majority of the respondents (85%) were married. Majority (65%) of the respondents are graduates with technical and IT background. Majority of the respondents (50%) are from top /Administrative level, followed by middle/executive level (40 %). Majority of the
respondents (35 %) have expertise in customer service and customer relationship management, followed by information and communication technology and logistics and supply chain management with 20 percent each. About 40 percent of the respondents have more than 15 years of experience in use of e-commerce retail consumer purchase in their respective domain areas, specifically customer relationship management followed by respondents with 10-15 years of experience, specifically in L&SCM and ICT. The Chi-square test statistic results at 5% level of significance shown in Table 4.1 revealed that respondents’ age ($\chi^2 = 20.05$, df 9, $p < 0.025$), education ($\chi^2 = 30.76$, df 6, $p < 0.001$), and their experience ($\chi^2 = 20.59$, df 9, $p < 0.025$), are significantly diverse with type of retail organisation in contrast to the respondents’ gender, marital status, designation and expertise which are not significant with the type of retail sector considered in the research. The Chi-square results implied that retail managers in the age group of 35-45 with PG qualification and more than fifteen years of experience have significant association with type of retail sector. Retail managers’ choice of retail sector using-e-commerce retail consumer purchase are significantly differed with their age, educational qualification and years of experience. Retail managers’ age, education and experience are not independent of type of retail sector.

4.1 Trust of Population on e-commerce

Results shown in Table 2 reveal that, overall, 90.5 percent of respondents have trust in retail organisation’s working on e-commerce analytics in various business functions. 92 percent of respondents from apparel retailing have trust in organisation’s working one-commerce analytics, followed by consumer durable retailing (91%), food and grocery (90%) and entertainment retailing (89.5%). The Chi-square statistic results ($\chi^2 = 0.90$, df 3, $p > 0.05$) indicate that there is no difference in the distribution of responses to the outcome variable among the comparison groups. There is no difference among retail managers’ trust in four types of retail organisations’ working one-commerce. The results shown in Figure 2, by and large, are explicitly implied that respondents have high levels of trust in their retail organisations’ working one-commerce analytics.

<table>
<thead>
<tr>
<th>Respondent Trust</th>
<th>Apparel sector (n=180)</th>
<th>Food &amp; Grocery sector (n=155)</th>
<th>Consumer durable sector (n=140)</th>
<th>Entertainment sector (n=105)</th>
<th>Total (n=580)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>166 (92.00)</td>
<td>139 (89.67)</td>
<td>126 (90.97)</td>
<td>94 (89.52)</td>
<td>525 (90.51)</td>
</tr>
<tr>
<td>No</td>
<td>14 (8.00)</td>
<td>16 (10.32)</td>
<td>14 (9.03)</td>
<td>11 (10.47)</td>
<td>55 (9.48)</td>
</tr>
<tr>
<td>Total</td>
<td>180 (100)</td>
<td>155 (100)</td>
<td>140 (100)</td>
<td>105 (100)</td>
<td>580 (100)</td>
</tr>
</tbody>
</table>

Source: primary data
Note: Values given in parenthesis are calculated in percentage of their column totals.

Figure 2: Trust in e-commerce during pandemic

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http://dx.doi.org/10.29322/IJSRP.12.11.2022.p13102  www.ijsrp.org
Results shown in Table 3 reveal that, overall, 18.44 percent of respondents’ indicated that CRM systems is the most preferred tool for retaining customers followed by loyalty programs (17.06%), regular reviews (11.20%), social media (8.44%), blogs (7.75%), premiums & gifts (7.58%), questionnaires and surveys (7.06%), personal touches (6.20%), and magic moments (6.03%). The Chi-square statistic results ($\chi^2 = 7.81$, df 27, $p > 0.05$) reveal that there is no difference in the distribution of responses to different strategies for customer retention among the comparison groups.

Table 3: Adoption of customer retention strategies in e-commerce

<table>
<thead>
<tr>
<th>Retention strategies</th>
<th>Apparel sector (n=180)</th>
<th>Food &amp; Grocery sector (n=155)</th>
<th>Consumer durable sector (n=140)</th>
<th>Entertainment sector (n=105)</th>
<th>Total (n=580)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRM systems</td>
<td>34 (18.88)</td>
<td>32 (20.63)</td>
<td>23 (16.42)</td>
<td>18 (17.14)</td>
<td>107 (18.44)</td>
</tr>
<tr>
<td>Loyalty programs</td>
<td>26 (14.45)</td>
<td>27 (17.41)</td>
<td>30 (21.42)</td>
<td>16 (15.23)</td>
<td>99 (17.06)</td>
</tr>
<tr>
<td>Regular reviews</td>
<td>20 (11.12)</td>
<td>18 (11.60)</td>
<td>15 (10.71)</td>
<td>12 (11.42)</td>
<td>65 (11.20)</td>
</tr>
<tr>
<td>Social media</td>
<td>19 (10.55)</td>
<td>16 (10.32)</td>
<td>12 (8.57)</td>
<td>12 (11.42)</td>
<td>59 (10.17)</td>
</tr>
<tr>
<td>Blogs</td>
<td>15 (8.34)</td>
<td>15 (6.46)</td>
<td>12 (8.57)</td>
<td>12 (11.42)</td>
<td>49 (8.44)</td>
</tr>
<tr>
<td>Premiums &amp; Gifts</td>
<td>16 (8.88)</td>
<td>15 (6.46)</td>
<td>11 (7.86)</td>
<td>8 (7.61)</td>
<td>45 (7.75)</td>
</tr>
<tr>
<td>Questionnaires and surveys</td>
<td>15 (8.33)</td>
<td>12 (7.74)</td>
<td>11 (7.86)</td>
<td>6 (5.71)</td>
<td>44 (7.58)</td>
</tr>
<tr>
<td>Personal touches</td>
<td>13 (7.23)</td>
<td>10 (6.46)</td>
<td>10 (7.14)</td>
<td>8 (7.62)</td>
<td>41 (7.06)</td>
</tr>
<tr>
<td>Magic moments</td>
<td>10 (5.66)</td>
<td>10 (6.46)</td>
<td>9 (6.43)</td>
<td>7 (6.66)</td>
<td>36 (6.20)</td>
</tr>
<tr>
<td>Welcome book</td>
<td>12 (6.66)</td>
<td>10 (6.46)</td>
<td>7 (5.0)</td>
<td>5 (5.71)</td>
<td>35 (6.10)</td>
</tr>
</tbody>
</table>

Source: Primary data
Note: Values given in parenthesis are calculated in percentage of their column totals

4.2 Inferential statistics

The previously described descriptive statistics and factor analysis results were used to test the formulated hypotheses and further analyse the role of e-commerce retail consumer purchase in customer acquisition and retention strategies. The results were described in the following paragraphs and tables.

H1: There is no mean difference among retail organisations in defining e-commerce retail consumer purchase

H1a: There is significant mean difference among retail organization in defining e-commerce retail consumer purchase

To test the above hypothesis, On-way MANOVA is used. The overall test of the One-way multivariate analysis of variance relationship shown in Table 4.39 was rejected at the 0.05 significance level (Pillai’s Trace= 0.500,
F [39, 1698] = 4352.218, p= 0.001; [Wilk’s Lambda = 0.573, F [39, 1670.872] =8.868, p=0.001; Hotelling’s Trace= 0.625, F [39, 1688] =9.012, p=0.001). The results indicated that all three tests were significant. The decision was made that there are mean differences in defining-commerce retail consumer purchase among retail organisations, and further testing was needed. In table 4 multivariant analysis of retail organizations and perception towards-commerce on retail is presented.

### Table 4: One-way Multivariate analysis of variance

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig. (p-Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.990</td>
<td>4352.218</td>
<td>13.000</td>
<td>564.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Wilks’ Lambda B</td>
<td>0.010</td>
<td>4352.218</td>
<td>13.000</td>
<td>564.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Hotelling’s Trace B</td>
<td>100.317</td>
<td>4352.218</td>
<td>13.000</td>
<td>564.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Type of retail Organization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillai’s Trace B</td>
<td>0.500</td>
<td>8.703</td>
<td>39.000</td>
<td>1698.00</td>
<td>0.000</td>
</tr>
<tr>
<td>Wilks’ Lambda B</td>
<td>0.573</td>
<td>8.868</td>
<td>39.000</td>
<td>1670.87</td>
<td>0.000</td>
</tr>
<tr>
<td>Hotelling’s Trace B</td>
<td>0.625</td>
<td>9.012</td>
<td>39.000</td>
<td>1688.00</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Design: Intercept + Type of Retail Organization  
b. Exact statistic  
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Source; Primary data

To determine how the dependent variables, differ for the independent variable, the Univariate ANOVA tests were conducted for each dependent variable. The results (tests of between-subjects effects) revealed that there was significant effect (P<0.005) of retail organisation groups on perceptions of e-commerce retail consumer purchase except one perception such as segmenting and targeting customers precisely and optimising customer experiences (p > 0.053).

Further Tukey’s HSD post-hoc tests were conducted to follow up the significant ANOVAs identified in tests of between-subjects effects. By and large, the multiple comparisons table reveals that mean difference among retail groups for each perception of e-commerce retail consumer purchase was statistically significant (p<0.05) except in some cases where p-value is greater than 0.05. The mixed results implied that there are some similarities and differences among retail groups with respect to perceptions of e-commerce retail consumer purchase.

It was proved that there were significant mean differences in defining-commerce retail consumer purchase among four retail organisations. Further, the error variance of the dependent variables was also proved equal across groups among all perceptions of e-commerce retail consumer purchase. Hence, null hypothesis was failed to be accepted and alternative hypothesis (H1a) was proved to be accepted for all perceptions of e-commerce retail consumer purchase.

**H2a:** Retail organizations and important parameterse-commerce analytics are statistically independent.  
**H2a:** Retail organizations and important parameterse-commerce analytics are statistically dependent

To test the above hypothesis, Chi-square statistic is used for testing difference /independence /association of two variables. The Chi-square statistic results ($\chi^2$=0.14, df9, p>0.05) shown in Table 4.10 reveals that there is no difference in the distribution of responses to the outcome variable (i.e., important parameter of e-commerce analytics) among the comparison groups (i.e., type of retail organisation). Thus, null hypothesis (H2o) is proved to be accepted.

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www.ijsrp.org
The results implied that given the parameters of e-commerce retail consumer purchase were independent on type of retail organisation. Importance of parameters of e-commerce retail consumer purchase were differentiated by comparison groups in retailing. The distribution of the observed number of important parameter of e-commerce retail consumer purchase does not differ significantly among retail organisations.

**H3a: There is no difference in objectives of e-commerce analytics among retail organisations.**

**H3a: There is significant difference in objectives of e-commerce analytics among retail organisations.**

To test the above hypothesis, Chi-square statistic is used. The Chi-square statistic results ($\chi^2=61.38$, df12, $p<0.001$) shown in Table 5 reveals that there is significant difference in the distribution of responses to the objectives e-commerce analytics among the comparison groups (i.e., type of retail organisation). Thus, null hypothesis (H30) is failed to be accepted. Hence alternative hypothesis (H4a) is proved to be accepted.

The results implied that retail organisations and objectives of e-commerce retail consumer purchase are statistically dependent. Objectives of e-commerce retail consumer purchase were differentiated by comparison groups in retailing. The distribution of the observed number of objectives of e-commerce retail consumer purchase differed significantly among retail organisations.

### Table 5: Objective of e-commerce

<table>
<thead>
<tr>
<th>Objectives of e-commerce retail consumer purchase</th>
<th>Apparel sector (n=180)</th>
<th>Food &amp; Grocery sector (n=155)</th>
<th>Consumer durable sector (n=140)</th>
<th>Entertainment sector (n=105)</th>
<th>Overall (n=580)</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer centric Outcomes</td>
<td>1 (86)</td>
<td>1 (73)</td>
<td>1 (71)</td>
<td>2 (21)</td>
<td>1 (251)</td>
<td></td>
</tr>
<tr>
<td>Operational Optimization</td>
<td>3 (24)</td>
<td>2 (36)</td>
<td>2 (28)</td>
<td>1 (53)</td>
<td>2 (141)</td>
<td></td>
</tr>
<tr>
<td>Financial Management</td>
<td>2 (33)</td>
<td>4 (16)</td>
<td>3 (19)</td>
<td>3 (14)</td>
<td>3 (82)</td>
<td></td>
</tr>
<tr>
<td>Risk Management</td>
<td>4 (20)</td>
<td>5 (12)</td>
<td>4 (14)</td>
<td>4 (9)</td>
<td>4 (55)</td>
<td></td>
</tr>
<tr>
<td>New Business Model</td>
<td>5 (17)</td>
<td>3 (18)</td>
<td>5 (8)</td>
<td>5 (8)</td>
<td>5 (51)</td>
<td></td>
</tr>
</tbody>
</table>

**H4a: There is no mean difference of opinion among retail organisations on major obstacles in adopting e-commerce retail consumer purchase.**

**H4a: There is significant mean difference of opinion among retail organisations on major obstacles in adopting e-commerce retail consumer purchase.**

To test the above hypothesis, On-way MANOVA is used. The overall test of the One-way multivariate analysis of variance relationship shown in Table 4.40 was rejected at the 0.05 significance level (Pillai’s Trace= 0.440, $F [33, 1704] = 8.868, p=0.001; [Wilk's Lambda = 0.608, F [33, 1668.244] =9.311, p=0.001; Hotelling’s Trace= 0.570, $F [33, 1694] =9.756, p=0.001). The results indicated that all three tests were significant. The decision was made that the differences did exist among retail organisations on major obstacles in adopting e-commerce retail consumer purchase, and further testing was needed. In table 5 presented about multivariate analysis of retail organization and obstacles in e-commerce.

### Table 5: One-way Multivariate analysis of variance between retail organization and obstacles in adopting e-commerce

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig. (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>Pillai's Trace</td>
<td>0.990</td>
<td>4889.323b</td>
<td>11.000</td>
<td>566.000</td>
</tr>
</tbody>
</table>

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http://dx.doi.org/10.29322/IJSRP.12.11.2022.p13102  www.ijsrp.org
To determine how the dependent variables differ for the independent variable, the Univariate ANOVA tests were conducted for each dependent variable. The results (tests of between-subjects effects) revealed that there was significant effect (P<0.005) of retail organisation groups on major obstacles except insufficient infrastructure and lack of internal skills (p >0.053) in adopting-commerce retail consumer purchase.

Further Tukey’s HSD post-hoc tests were conducted to follow up the significant ANOVAs identified in tests of between-subjects effects. By and large, the multiple comparisons table reveals that mean difference among retail groups for major obstacle in adopting-commerce retail consumer purchase was statistically significant (p<0.05) except in some cases where p-value is more than 0.04. The mixed results implied that there are some similarities and differences among retail groups with respect to perceptions of e-commerce retail consumer purchase.

It was proved that there was significant difference exist among four retail organisations towards major obstacles in adopting-commerce analytics. Further, the error variance of the dependent variable was also proved equal across groups among all major obstacles of e-commerce analytics. Hence, null hypothesis (H50) is failed to be accepted and alternative hypothesis (H5a) is proved to be accepted for major obstacles in adopting-commerce retail consumer purchase. The results implied that there is an association between retail organisation and major obstacles in adopting-commerce retail consumer purchase.

To test the above hypothesis, On-way MANOVA is used. The overall test of the One-way multivariate analysis of variance relationship shown in Table 4.41 was rejected at the 0.05 significance level (Pillai’s Trace= 0.318, F [24, 1713]= 8.455, p= 0.001; Wilk’s Lambda = 0.707, F [24, 1650.874]=8.7238, p=0.001; Hotelling’s Trace= 0.379, F [24, 1703]=8.964, p=0.001). The results indicated that all three tests were significant. The decision was made that the differences did exist among retail organisations toward challenges faced by retail organisations in implementin-commerce retail consumer purchase, and further testing was needed. In table 6 presented about multivariant analysis of retail organization and challenges in implementation of e-commerce analytics is presented.

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wilks’ Lambda</td>
<td>0.010</td>
<td>4889.323</td>
<td>11.000</td>
<td>566.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>95.02</td>
<td>4889.323</td>
<td>11.000</td>
<td>566.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>95.02</td>
<td>4889.323</td>
<td>11.000</td>
<td>566.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Pillai’s Trace</td>
<td>0.440</td>
<td>8.868</td>
<td>33.000</td>
<td>1704.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Wilks’ Lambda</td>
<td>0.608</td>
<td>9.311</td>
<td>33.000</td>
<td>1668.244</td>
<td>0.000</td>
</tr>
<tr>
<td>Hotelling’s Trace</td>
<td>0.570</td>
<td>9.756</td>
<td>33.000</td>
<td>1694.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Roy’s Largest Root</td>
<td>0.407</td>
<td>21.037</td>
<td>11.000</td>
<td>568.000</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Design: Intercept + Type of retail organization
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.
d. Computed using alpha = .05

Source: Primary data
To determine how the dependent variable differs for the independent variables, the Univariate ANOVA tests were conducted for each dependent variable. The results shown (tests of between-subjects effects) revealed that there was significant effect (P<0.005) of retail organisation groups on major challenges except inadequate analytics resources, poor data quality and outdated software and tools (p > .053) in implementing e-commerce retail consumer purchase.

**H6**: There is no difference in impact of e-commerce analytics technology on business processes among retail organisations.

**H6a**: There is significant difference in impact of e-commerce analytics technology on business processes among retail organisations.

To test the above hypothesis, Chi-square statistic is used for testing difference/association between e-commerce technology and business processes of retail organisations. The Chi-square statistic results ($\chi^2=25.12$, df 15, p<0.05) shown in Table 8 reveals that there is significant difference in the distribution of responses to impact of e-commerce analytics technology on business processes among the comparison groups (i.e., four types of retail organisations). Thus, null hypothesis (H60) is failed to be accepted. It means alternative hypothesis (H6a) is accepted.

**Table 8: Retail Business Benefits**

<table>
<thead>
<tr>
<th>Business processes that e-commerce technology can have the greatest impact</th>
<th>Apparel sector (n=180)</th>
<th>Food &amp;Grocery sector (n=155)</th>
<th>Consumer durable sector (n=140)</th>
<th>Entertainment sector (n=105)</th>
<th>Total (n=580)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer-centric merchandising</td>
<td>1 (52)</td>
<td>1 (48)</td>
<td>1 (41)</td>
<td>1 (32)</td>
<td>1 (173)</td>
</tr>
<tr>
<td>Targeted offers and promotions</td>
<td>2 (46)</td>
<td>3 (27)</td>
<td>3 (26)</td>
<td>3 (18)</td>
<td>2 (117)</td>
</tr>
<tr>
<td>Demand forecasting and supply chain modelling</td>
<td>3 (30)</td>
<td>4 (21)</td>
<td>2 (35)</td>
<td>2 (27)</td>
<td>3 (113)</td>
</tr>
<tr>
<td>Loyalty program Management</td>
<td>4 (24)</td>
<td>2 (36)</td>
<td>4 (17)</td>
<td>4 (17)</td>
<td>4 (94)</td>
</tr>
<tr>
<td>Store design</td>
<td>5 (16)</td>
<td>5 (14)</td>
<td>5 (16)</td>
<td>5 (6)</td>
<td>5 (52)</td>
</tr>
</tbody>
</table>

Source: Primary data
The results implied that business processes in retail organisations are highly impacted by e-commerce analytics technology. It means that there is significant association between the two variables. The statistically significant difference proves a causal relationship between two variables.

H9: Deployment of e-commerce analytics will not mediate the relationship between customer process and customer acquisition in retail organisations

H9a: Deployment of e-commerce analytics will not mediate the relationship between customer process and customer acquisition in retail organisations

To test the above hypothesis, simple linear regression analysis is used to estimate the mediating effect of deployment of e-commerce analytics on the relationship between customer process and customer acquisition. The resulting regressing models for customer acquisition with customer process mediated by e-commerce analytics is statistically significant \[F (2,577) =5.809, p=0.003\]. The results shown in ANOVA Table 7 indicate that independent variable such as customer process and mediating variable e-commerce analytics are related to dependent variable (i.e., customer acquisition). The modal summary of regression model for customer acquisition shown in Table 8 contributed meagrely and predicted 1.6 percent variation by customer process and mediating variable e-commerce analytics.

### Table 7: ANOVA statistics for customer process, moderating variable (big data analytics) and customer acquisition

<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>1 Regression</td>
<td>28.276</td>
<td>2</td>
<td>14.138</td>
<td>5.809</td>
<td>.003*</td>
</tr>
<tr>
<td>Residual</td>
<td>1404.240</td>
<td>577</td>
<td>2.434</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1432.516</td>
<td>579</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: customer acquisition
b. Predictors: (Constant), Mediator (big data analytics), customer process

Source: Primary data

### Table 8: Model summary for regression model

<p>| Model Summary |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|</p>
<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>
<th>Change Statistics</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.140a</td>
<td>.020</td>
<td>.016</td>
<td>1.560</td>
<td>.020</td>
<td>5.809</td>
<td>2</td>
<td>577</td>
<td>.003</td>
<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Mediator (big data analytics), Customer service

Source: Primary data

The coefficient summary for evolved regression models shown in Table 9 revealed that customer process (\(\beta=0.207, t=3.085, p=0.005\)) and mediating variable e-commerce analytics (\(\beta=0.190, t=2.113, p=0.05\)) were the significant predictors for customer acquisition in retailing organisations. Thus alternative hypothesis (H12a) is accepted.
Although the regression model was significant, the mediating role of e-commerce analytics between customer process and customer acquisition is significant but not strong. Overall, the results indicate that null hypothesis (H9_0) is failed to be accepted and alternative hypothesis (H9_a) is proved to be accepted. It indicates that there is a need to improve the effective use of e-commerce analytics in customer acquisition process.

H10_0: Retailers' customer acquisition will not increase as their e-commerce retail consumer purchase deployment increase.

H10_a: Retailers' customer acquisition will increase significantly as their e-commerce retail consumer purchase deployment increase.

To test the above hypothesis, simple linear regression analysis is used to estimate the influence of e-commerce retail consumer purchase on customer acquisition. The resulting regressing model for customer acquisition with e-commerce analytics is statistically significant (F (1,578) =83.650, p=0.001). The regression modal summary results shown in Table 10 indicate that independent variables are related to dependent variable, and predicted by 12.6 percent variation bye-commerce analytics in customer acquisition.

Table 10: Regression modal summary

<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>
<th>Change Statistics</th>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig. Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.356*</td>
<td>0.126</td>
<td>0.125</td>
<td>0.127</td>
<td>0.126</td>
<td>83.650</td>
<td>1</td>
<td>578</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant),e-commerce analytics

Source: Primary data

The coefficient summary for evolved regression models shown in Table 10 revealed that e-commerce analytics (β=0.320, t=9.146, p=0.005) had significant influence on customer acquisition in retailing organisations. Thus alternative hypothesis (H10_a) is accepted.

Table 11: Coefficient summary for regression model

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t-value</th>
<th>Sig. (p-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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The results disproved the null hypothesis (H10) and accepted alternative hypothesis (H1a) that the increase of deployment of e-commerce analytics significantly increase the customer acquisition in retailing.

**H10**: Retailers’ customer retention will not increase as their e-commerce retail consumer purchase deployment increase.

**H1a**: Retailers’ customer retention will increase significantly as their e-commerce retail consumer purchase deployment increase.

To test the above hypothesis, simple linear regression analysis is used to estimate the influence of e-commerce retail consumer purchase on customer retention. The resulting regression model for customer retention with e-commerce analytics is statistically significant (F (1,578) = 158.608, p=0.001). The regression modal summary results shown in Table 12 indicate that independent variables are related to dependent variable, and predicted by 21.3 percent variation by e-commerce analytics in customer retention strategies.

### Table 12: Regression modal summary

<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>
<th>Change Statistics</th>
<th>R Square Change</th>
<th>F Change</th>
<th>df1</th>
<th>df2</th>
<th>Sig. F Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.464&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.215</td>
<td>.214</td>
<td>.399</td>
<td>215</td>
<td>158.608</td>
<td>1</td>
<td>578</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary data

The coefficient summary for evolved regression models shown in Table 13 revealed that e-commerce retail consumer purchase (β=0.169, t=12.594, p=0.0015) had significant influence on customer retention in retailing organisations.

### Table 13: Coefficient summary for regression model

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig. (p-value)</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)</td>
<td>1.352</td>
<td>0.051</td>
<td>26.547</td>
</tr>
<tr>
<td></td>
<td>Big data analytics</td>
<td>0.169</td>
<td>0.013</td>
<td>12.594</td>
</tr>
</tbody>
</table>

Source: Primary data

The results failed to accept null hypothesis (H11a). The alternative hypothesis (H11a) is proved to be accepted that the increase of deployment of e-commerce analytics significantly increase customer retention in retailing.
V. DISCUSSION

The present findings contribute to the better understanding of e-commerce analytics in retailing in India, an area that has received scant attention within the academic literature. From the findings, it is evident that retailers in India are not using e-commerce analytics, due to the lack of an obvious use case to justify the implementation costs. Furthermore, the study has shown a debate around the definition of e-commerce analytics, as well as a multitude of conflicting perceptions on the concept. The findings showed that retail organisations are not very serious toward using e-commerce analytics because there is a focus on exploiting existing structured data completely before tapping into unstructured and semi structured data. Some retailers are, however, leveraging the enhanced processing speeds e-commerce analytic products to improve on traditional analytics. Thus, this research encourages retailers to change their beliefs about e-commerce retail consumer purchase, and it also encourages academics to further explore the antecedents and impact of e-commerce analytics in the retailing industry. The overall results of this study show that there is no difference among four retail organisations in relation to important parameters, important elements e-commerce analytics. However, ‘veracity of thee-commerce’ and ‘technology of e-commerce analytics’ are emerged as the most important parameter and element e-commerce retail consumer purchase respectively. The results underline the extreme importance e-commerce retail consumer purchase across four retail organisations albeit they are not very serious of using e-commerce analytics as less than adequate access to relevant, accurate and timely e-commerce as well as availability e-commerce analytics capabilities in retail organisations. The statistical results also highlighted customer centric outcomes and operational optimizations are the most sought after objectives e-commerce retail consumer purchase across four retail organisations. It is understood that desired 217 outcomes e-commerce retail consumer purchase are customer engagement/experience management and optimizing retail operations. The statistically significant findings emphasized that understanding customers by establishing a single view across multiple sources of customer information (point-of-sale, loyalty program, social media, etc.) is the key challenges, apart from other three challenges, needs to be addressed across four retail organisations. The study also identified twelve major obstacles in adopting e-commerce retail consumer purchase in retail organisations. Out of which, ‘lack of understanding of how to use data analytics to improve the business’ is the major obstacle in adopting e-commerce retail consumer purchase. It is understood that e-commerce analytics has not been integrated with the organisational vision and mission as seriousness toward the use e-commerce analytics is minimal. Supporting the aforesaid findings, the findings emphasise delivery of insights to the right resource at the right time is the key challenge that prevent retailers from implementing e-commerce analytics across four retail organisations. This is due to lack of clearly articulated analytics strategy in retail organisations as it is identified as second challenge in implementation of e-commerce analytics. Furthermore, the results identified and examined that different users and different departments have different ways of measuring the business is the biggest obstacles in getting e-commerce analytics in order to make better data-driven business decisions in retail organisations besides five other biggest obstacles. The statistical findings also underlined the cost and/or complexity of implementing e-commerce solutions is the obstacle preventing retail organisations from using e-commerce. The findings underline customer and market analysis, followed by product development and management are two major business functions in the retail organisations stand to make the best use of insights from e-commerce retail consumer purchase. In alignment with earlier findings, customer centric merchandising, targeted offers and promotions are the chief business processes immensely benefited from e-commerce analytics in retail organisations. The study identified six kinds of business values of using e-commerce analytics. Out of which, better, fast-based decision making is the ultimate tangible value derived from using e-commerce analytics across four retail organisations.

VI. CONCLUSION

Consumer retention is key factor in effective development and advancement in any business. This paper evaluated the contribution of e-commerce analytics on the customer analytics and customer retention. The data for analysis of e-commerce analytics on customer retention is evaluated based on primary data collection technique. The collected data were statistically examined for evaluation of customer retention and analytics. The statistically significant findings underscored the influence of e-commerce retail consumer purchase in customer acquisition and retention strategies in retailing. The findings also revealed the mediating role of e-commerce retail consumer purchase in the relationship between customer process and customer acquisition in retailing.

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Authors

First Author – Professor Baocheng He

Baocheng He is currently a professor at the School of Economics and Management, Shaanxi University of Science and Technology. He is a visiting Scholar at Ulster University, UK.

He Served as the financial consultant of the Standing Committee of Shaanxi Provincial People’s Congress, the 58th batch of post-doctoral science fund general projects of the Ministry of Culture.

He received his PhD Degree in management from the Northwest University. Professor Bao is a Postdoctoral Scholar of Accounting at Xian Jiaotong University.

Prof.Baocheng is the National Winner of “Research Project on System Design of Cultural Service System”. He won the third prize of the 13th Outstanding Achievement in Philosophy and Social Science of Shaanxi Province, the third prize of the 12th Outstanding Achievement in Philosophy and Social Science of Shaanxi Province, and the third prize of Outstanding Achievement in Humanities and Social Sciences of Shaanxi University Award” and "Shaanxi Provincial CPPCC Outstanding Paper Award" as the first author.

Prof.Bao works in the area of Digital Economy including corporate finance, financial technology and big data auditing. He Published More than 20 articles in refereed journals and proceeding in above areas as a first author including 2 in Guangming Daily, 1 reprint from Xinhua Digest, 1 reprint from National People's Congress, and 1 article the CSSCI journal, published 1 article in foreign journals and indexed by EI. 3 articles.Presided over the completion of ten provincial projects, including the Shaanxi Provincial Social Science
Fund and the Provincial Department of Science and Technology Soft Science, as well as five departmental projects, including the Xi’an Social Science Fund.
Email: hebaocheng@sust.edu.cn

Second Author & Correspondence Author – Mohammad Al Masum currently Studying in Shaanxi university of science and technology as a masters student. He is majoring in business administration (MBA). Masum’s research field of interest is Business Ethics, E-commerce.
Email: Ls08200315@sust.edu.cn
Email: know_mma@outlook.com
Phone: +8615664921882(wechat)
5g Network For High Speed Video Streaming With Encoding And Decoding Digital Circuit

Binu C T
Binuct143@gmail.com
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ABSTRACT: The high speed internet helps to increase the usage of video streaming. The existing system have lack of speed for video streaming which down the video streaming industry. The proposed system uses new encoding and decoding which increases the speed of video streaming. It also uses an equation to increases the speed of video streaming. The size of data is calculated based on latency time and response time. When we get the first data and then size is calculated. Based on the first data and size next data is calculated.

KEYWORDS: video streaming, high speed network, encoding

I. INTRODUCTION

1. XtremeHD

XtremeHD helps on streaming across the globe in ultra-high definition is what you seek. By simply signing up to its services, you get access to over 20000 live channels and VODs. You get access to popular shows from the US, UK, Canada, and more countries across the globe. Each of its subscription plans comes with an EPG TV Guide to help you navigate through the broadcasting schedule so you know exactly when to catch your favourite shows or movies. You also get the privilege of watching videos in Full HD, HD, and SD resolution. In addition, XtremeHD IPTV also features anti-freeze technology, meaning you’ll be able to enjoy content without interruption.

2. Youtube

YouTube still has been one of the finest free streaming services in high demand. It not only bought a variety of good content free to the mobile screens of many smartphone users, but it also provided many talented folks to become creators in their own right by producing and publishing video content of their own, thus becoming celebrities overnight. YouTube TV takes this concept and expands on it by asking subscribers to pay an affordable fee to get their content without the annoyance of ads. However, that alone can’t be an enticing option, so YouTube also launched its own original content programming to compete with Netflix and Prime.

YouTube TV now boasts of broadcasting over 85+ channels in one streaming platform, which includes content from Sports, News, and Entertainment. It allows you to record your favourite shows with unlimited storage and provides you with 6 accounts at a time.

3. Netflix

When Netflix began showcasing licensed content nobody even imagined the revolution it was starting with regards to online streaming of entertainment. People were charmed by its services and grew addicted to the service it was providing.
Fast forward to 2021 and Netflix exhibits the majority of the content that is being produced in the United States alone. It is also a major player in creating original content by partnering with creators from across the world. Shows House of Cards and Stranger Things are already pop culture phenomenon’s that have only boosted in popularity.

Although Netflix faces tough competition with new and old players bringing their A-game in, the platform still has the upper hand by being the pioneer of the streaming services we know and consume today.

II. BIG DATA ANALYSIS

Latency is the time it takes for a data packet to travel from one designated point to another. Response time is the time taken to transmit the data process it by the computer, and transmit the response back to the terminal.

Performance Time $t = \text{latency} - \text{Response}$

Let $t$ is the time , $l$ is the latency and $r$ is the response. Then the equation

$$5l^3 - 3r^2 + t + d = 0$$

Digit sum of $d'$ will get the actual size of the data.

Assume that first data is $d_{\text{first}}$

$d_{\text{next}}$ is given by

$$d_{\text{next}} = \frac{d_{\text{first}}}{(2^{7/8} \times 1024 \times 1024)}$$

Have to take six digit from right after the decimal point of $d_{\text{next}}$ will get $d_{\text{actual}}$

Example:

Let latency time is 5 and response time is 5.25

Performance Time $t = \text{latency} - \text{Response}$

So performance time is 0.25

Let the request send and performance time is 15 minutes by using the equation

$$5 \times (5)^3 - 3 \times (5.25)^2 + 0.25 + d = 0$$

$.545.5625 + d = 0$

$d = -.545.5625$

size = 5 + 4 + 5 + 5 + 6 + 2 + 5

size = 32 bits

Let the first data is 5000

$$D_{\text{next}} = \frac{5000^4}{(32 \times 1024 \times 1024)}$$

$$D_{\text{next}} = 18626451.49231$$

$d_{\text{actual}} = .6264451.5$ round as 6000
III. ENCODING AND DECODING

ENCODING

X1 and X2 are the inputs to the digital circuit and ‘e’ is the output after encoding. AND, NOT, OR and NAND gates are used for encoding.

<table>
<thead>
<tr>
<th>X</th>
<th>Y</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

DECODER

X and Y are encoded value and CLK is the clock. The decoder circuit decode E to X1X2X3X4 with clock. AND, OR gates are used to design the circuit.
The impact of Information and Communication Technologies (ICT) on diplomatic communication

Mohamed Ali Elsherif

phd candidate

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Abstract- As technology advances, interstate communication has become faster. The use of the telegraph made it possible to send messages over long distances in a shorter time, and another breakthrough occurred with the advent of the telephone in the 1870s by Alexander Graham Bell and also the advent of radio technology that revolutionized communication. Radio communication enabled states to engage not only their citizens on foreign policy issues, but also the foreign public. In the same way, the use of fax increased the speed of sending written information. On the other hand, the use of the telephone increased the indulgence of countries towards summit diplomacy, where directors participate in direct conversations with their colleagues and reduced the need to send envoys, but also speeded up communication by reducing diplomatic bureaucracy. The invention of satellites eventually led to the use of mobile phones on April 3, 1973 at the initiative of Motorola, which allowed phone calls to reach even the most remote areas on the planet. Mobile phone technology has since enabled remote support during negotiation processes and also supports bilateral relationships as they are personal to the owner. In the same way, the discovery and use of air transport improved the speed with which deputies traveled to foreign countries, but also increased the diplomacy of the summit.

Index Terms- Technology, messages, diplomacy, mobile, invention

I. INTRODUCTION

Diplomacy deals with the management of relations between states and between states and other actors. From a state perspective, diplomacy deals with advising, shaping and implementing foreign policy. The development of diplomatic relations between the two actors depends on mutual recognition and mutual readiness to facilitate the relationship. The result can be an exchange of ambassadors or other diplomats, in order to create dialogue and cooperation between the two actors. Multilateralism represents several members or actors working together to address an issue, gain understanding, and help each other achieve common goals.

Diplomacy is a principled substitute for the use of force or covert means in statecraft. Thus comprehensive national power is applied to the peaceful adjustment of differences between states. It can be considered coercive, but typically non-violent measures.1

In addition to diplomats, who serve as the main instrument in diplomacy and its primary practitioners, one can find other tools involved in the process such as international summits, conferences, international activities and informal interstate relations. The main two formats, or 'basis', of diplomatic behavior are bilateral and multilateral. Bilateral relations are seen as political, cultural and economic relations between two actors in the international arena, most often – states. The development of diplomatic relations between the two actors depends on mutual recognition and mutual willingness to facilitate the relationship. The result may be an exchange of ambassadors or other diplomats, in order to create dialogue and cooperation between the two actors. Multilateralism represents multiple members or actors working together to address an issue, reach understanding, and help each other achieve common goals.

II. CONCEPT AND PERSPECTIVES OF DIGITAL DIPLOMACY

According to Cull, public diplomacy emerged simultaneously with "statecraft". However, former American diplomat Edmund Gullion coined the term only in the mid-1960s. Therefore, public diplomacy is historically closely linked to the United States. The United States Information Agency (USIA) played a key role in the development of public diplomacy during the Cold War. However, in 1999, the agency was incorporated into the State Department. According to Kal, the attack of “11. September” became a rude awakening for American diplomacy and made him feel alienated from American foreign policy.2 In the last few decades, public diplomacy has been widely seen as a transparent means by which a sovereign state communicates with the public of other countries in order to inform and influence


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audiences abroad in order to promote the national interest and advance its foreign policy goals.

In this traditional view, public diplomacy is seen as an integral part of diplomacy between states, which implies conducting official relations, usually privately, between official representatives (leaders and diplomats) representing sovereign states. In this sense, public diplomacy includes activities such as educational exchange programs for scholars and students; visitor programs; language training; cultural events and exchanges; and radio and television broadcasting. Such activities have typically focused on improving the country's image or reputation as a way to shape the broader policy environment in the "host" country.3

Traditional public diplomacy represents an asymmetric communication model, focused on informing the target audience, using traditional media. With the emergence of new media and their wide use in all spheres of social life, they began to be used for public diplomacy activities. Since Hillary Clinton, the country's secretary of state, launched her own 21st century government program in 2009, her department has created 194 Twitter accounts and 200 Facebook pages with millions of "followers." The State Department actually runs a global media empire, according to Fergus Hanson, a fellow at the Brookings Institution, a think tank in Washington, and the author of a study on e-diplomacy.4

Thus, in this context, digital diplomacy is perceived as the increasing use of information communication technologies and social media platforms to implement public diplomacy strategies. This concept suggests that the environment and channels change, but the message remains the same. Instead of broadcasting via radio or television, diplomacy currently communicates via Twitter, Facebook, Tumblr. At the same time, digital diplomacy is an easy and cheap tool for other purposes as well: disaster response, information gathering and relationship management. Others believe that it increases the ability to interact with and actively engage with a foreign public, thus enabling the transition from monologue to dialogue. Thus, the Israeli embassy established a two-way communication with its followers through its Twitter channel.

In July 2013, as part of Israel's attempt to engage Internet users in the Gulf Cooperation Council (GCC) countries, Israel's Ministry of Foreign Affairs launched an official virtual embassy on Twitter called Israel in the GCC (IsraelintheGCC). Due to the absence of any diplomatic relations between Israel and the GCC countries, there was no opportunity to develop any diplomatic representation or provide any cultural or other type of cooperation in the region. This means that there was no possibility for any "soft power" tool to penetrate into the information space of the target audience, because any spread message from the Israeli side would be absorbed by the local audience.

The launch of the "Mission of Israel in the GCC" Twitter page introduced a new approach by engaging the people of the GCC in direct dialogue and secondly establishing a virtual "embassy". The most important feature in this approach that distinguishes this concept of digital diplomacy from the first is the use of two-way communication with the audience. During this virtual campaign, Israeli Foreign Minister Rafael Barak (Rafael Barak) answered questions from Twitter users from the Gulf region and beyond about the politics and economics of Israel's engagement in the GCC.

A brief discussion revealed interesting questions and comments from GCC Twitter users. This approach is mainly based on the narrative that current diplomacy is not only a matter for official representatives of states. Here, social media communities are recognized as a new and highly influential internal actor, whose influence could be valuable and decisive in public decision-making. Digital technologies such as social media platforms Twitter, Facebook and Weibo allow countries to engage in dialogic communication with foreign publics in an inexpensive way. Holmes uses this conceptualization to explore the broader role of e-diplomacy in the management of international change.

Drawing from sociological perspectives often referred to as "practice theory", he outlined two types of change in the international system: top-down structural exogenous shocks and bottom-up incremental endogenous displacement, and argued that diplomacy is ultimately a way for states to manage these two types of changes. Findings from psychology and neuroscience suggest that states manage these processes differently because each type of change requires different responses. Exogenous shocks require building relationships and understanding intent, activities that are most effectively carried out in face-to-face personal interactions.5

Endogenous change requires the ability to synthesize and analyze large amounts of data in order to determine changing trends, activities that are most effectively carried out with digital technology.

E-Diplomacy represents another set of activities, the collection and analysis of data from the foreign public, which is collected by listening to discourses in the field. This suggests that digital diplomacy should be seen, according to Holmes, as a method of managing change, especially the small types of change that would be difficult to detect with the human eye. Critically, the existence of digital diplomacy does not imply that traditional face-to-face diplomacy is no longer necessary, quite the opposite. Traditional and digital diplomacy coexist and complement each other, they do not compete with each other. So, ultimately, digital diplomacy is a special kind of diplomacy, the value of which derives from the ability of digital tools to identify and respond to small endogenous incremental changes in the international system. Knowledge and resource management, as another perspective, refers to the management and analysis of growing information flows.

As the sources of power have become more diffuse and decentralized, and public finances have either remained constant or declined, governments are trying to adapt, and the Internet is one convenient solution. In this case, it seems paradoxical, because the speed and ease of online communication allows rumors to spread faster and their control becomes a challenge for diplomats. Since in an interconnected world, more communication does not guarantee better communication, but on the contrary,

4 Virtual relations (2012). Foreign ministries are getting the hang of social media. http://www.economist.com/node/21563284
most often increases the possibility of misunderstanding and misinterpretation, there is a need to create a link between government information and cultural relations. Last but not least, this dimension emphasizes the use of digital technologies as a tool for more efficient management of everyday diplomatic activities, including communication, networks or hierarchical procedures.6

Cyber policy agendas are a perspective that encompasses various sub-dimensions, such as cyber governance, internet freedom, cyber warfare or cyber security. Given that in today’s diplomacy the public is paramount, governments find themselves in a control dilemma and while it is important to generate soft power, it is not always easy, especially in the cyber era. Therefore, digital disruption and its impact on governments requires taking advantage of resources such as infrastructure, networks, software and the human ability to create, control and transmit electronic information, a phenomenon known in the literature as "cyber power". In a detailed definition, cyber power is the ability to achieve desired results by using interconnected electronic sources of information. In this context, cyber power seems to depend on information management, the effectiveness of this process depends on the model of managing a large amount of information and on the degree of trust in available data and security systems. Consequently, Internet governance has become a new topic in relations between states because it requires international regulation of the cyberspace environment by developing, first of all, global formats of dialogue and cooperation.7

Paul Sharp, professor and head of political science at the University of Minnesota, explores one particular aspect of diplomacy, the way revolutions in information technology and the emergence of e-diplomacy have had a significant impact on what is known as "secret diplomacy." He singles out three discrete forms of secret diplomacy. Strategic secrecy, which refers to the concealment of major agreements and commitments. Operational secrecy which refers to the concealment of diplomatic negotiations, relations between diplomats and information of interest to diplomats and thirdly, official secrecy which refers to "known unknowns", things that are known but treated as if they were unknown. Sharp noted that digitization presents challenges and opportunities for any type of secrecy.8

III. THE ROLE OF SOCIAL MEDIA IN DIGITAL DIPLOMACY

Social media provides users with a comprehensive and rich experience for participation, interaction and collaboration. Various social media tools allow their users to create and share information on the web and interact with others, making it easier to find information and stay connected. With the inclusion of mobile technology, not only has there been an intense increase in the number and type of social media tools, but their use is also on the rise. In developed countries such as the USA, Poland, Great Britain and Korea, at least four out of ten adult citizens use social media tools. Social media sites dominate internet usage in Asia Pacific.9

Although the use of social media sites is currently more popular among young people, studies reveal that there has been an increasing trend of older participation in recent years. In general, social media can be classified into the following four categories: 1) online networks and ecosystems—eg. Facebook, LinkedIn, Twitter and Weibo (Facebook, LinkedIn, Twitter and Weibo); 2) online publications—eg. YouTube, Flickr, RSS, Instagram and Twitter (YouTube, Flickr, RSS, Instagram and Twitter); 3) Online platforms for collaboration — e.g. Wikis such as MediaWiki, blogs such as WordPress or Blogger and office collaboration solutions such as Office 365, Google Docs, Teamwork (Teamwork) or WorkSpot (Workspot); 4) online feedback systems, e.g. voting and debating, rating and commenting, polls and blogs.10

IV. E-DIPLOMACY

It is only natural that social networking sites have created a new dynamic and opened up a host of previously unimaginable opportunities for public diplomacy. The principles and strategies of public diplomacy are woven into most aspects of diplomatic activity. Digital technologies have reinforced an established theme in public diplomacy discourses over the last decade: namely, the "speaking" versus 'listening' debate often presented as 'public diplomacy 1.0' versus 'public diplomacy 2.0'. The difference is between top-down public diplomacy models and dialogue-based models in which there is an exchange of information and two-way communication between the public and government representatives. Thus, the diplomat becomes a strategically oriented handler of public opinion.

For the first time in international practice, as an independent digital diplomacy, the direction of the United States, which was seen as an important element of "soft" and then so-called "smart power", began to be actively applied. During 2006-2007, in the Department of State, the CIA, the Department of Defense and the United States Agency for International Development (USAID) more than fifteen departments were established to work with foreign Internet audiences, specifically for the analysis of domestic and international social networks, blogs and chats. Since that time, the capability of these units has been constantly increasing.

The first working group (consisting of 6 people) for Internet diplomacy in the State Department was formed in 2002. Based on it, the Office for Internet Diplomacy was formed in 2003. Since September 2013, it has been headed by Eric Nelson. The office is part of the information resources management department, which is responsible for the security of computer networks and the

introduction of ICT in the work of 260 American diplomatic missions.

In addition to the Office of e-Diplomacy, separate functions within digital diplomacy charged an additional 24 units of the internal State Department. These include the Office of Digital Engagement within the Office of Public Affairs, which is the State Department's official "DipNote" blog and maintains the Department of Social Media's official website, as well as the Bureau of Democracy, Human Rights and Labor, which together with USAID organizes the training of foreign internet activists. The first digital diplomacy projects were launched in the mid-2000s, under the administration of Secretary of State Rice, but the active development of the projects began only later when Secretary of State Hillary Clinton came to the Office. It began reforming the State Department based on the published "KDDR" report in 2010, providing units responsible for network work.11 At the beginning of 2010, Clinton managed to attract the heads of agencies of the largest private Internet companies (Google, Facebook, Twitter, Hovcast, AT&T) to cooperate. It is believed that she soon allowed the United States to directly influence the development of the "Arab Spring" in 2011, when protest activity in North Africa and the Middle East was encouraged with the help of modern means from outside.

Although he subsequently made personnel changes, John Kerry, who led the State Department in February 2013, generally maintained the wide use of digital technologies in the diplomatic practice of the United States. Conceptually, the idea of digital diplomacy is outlined in a number of State Department directives, including the so-called 2010 Quadrennial Review and the so-called "21st Century States" initiative.12

According to the latest document, the qualitative improvement of technology and the rapid growth of Internet users in developing countries require a change in US foreign policy practice and its reorientation to the possibilities of modern ICT. In general, according to its meaning, digital diplomacy must solve two major problems, to contribute to the improvement of the work of the State Department and to the strengthening of American influence on socio-political processes in other countries.

Obviously, some features of public diplomacy 2.0 need to be considered in detail. First, the new public diplomacy implies that career diplomats have largely lost control over the manipulation of public opinion and can no longer count on it. As Cull argued, society has gained significant power now more than ever before, and the public is no longer perceived as a passive object of diplomatic influence by wisdom. The public is now able to see the diplomat "over his shoulder" and judge what he sees. For diplomats, this means a significant loss of control. Second, public diplomacy 2.0 implies a much more stable and sincere level of engagement of diplomats: it is not enough to simply broadcast a message and expect foreign publics to accept it. It also makes it possible to overcome the negative perception of public diplomacy in the form of propaganda, and thus to develop a "legal and ethical" form of "symmetrical communication", during which the two sides will listen to each other.13 Third, Public Diplomacy 2.0 and diplomacy in general will largely rely on the web. According to Slaughter (Slaughter), the network is one of the defining characteristics of the modern world. War, diplomacy, business, media, community, and even religion - everything is integrated into the network. So, "in this world it is a measure of the power of communication." Finally, an important feature of public diplomacy 2.0 is the public attention it pays to it. As Nye noted, the mass flow of information brought about by modern communications has created a "paradox of abundance," in which the prize becomes attention, not information.14

Countries like China, Cuba and Russia are probably a bit more challenging on the digital diplomacy front. These governments have different ideas about the free flow of information from the United States, but they are also challenging because there are many sensitivities about US interference in the digital sphere. So, for example, officials in Russia indirectly blame the US for the invasion of Russian cyberspace. In addition, the US government tries to recruit bloggers in these countries, and they are seen as agents of the United States or as spies. More recent definitions have sought to clearly distinguish propaganda from other forms of communication. Therefore, propaganda can be seen as more than biased information aimed at promoting a political cause. Rather, it is the use of fabricated information or lies. Recently, many have argued that Russia is using propaganda when commenting on events in eastern Ukraine. Such was the case when Russian officials claimed that the soldiers arrested in Crimea were not part of a military incursion, but simply soldiers on leave who had wandered into Ukrainian territory. At the same time, Russian officials are also actively using social media to spread their messages and engage with foreign audiences. Since the beginning of the Ukraine crisis in January 2014, many have expressed concern about the increasing use of propaganda in Russia.

Since January 2014, the Russian Foreign Ministry has used Twitter to promote the narrative that Russia was forced to come to the aid of Russian minorities in Ukraine following a NATO-backed neo-Nazi coup in Kiev. In keeping with this narrative, tweets detailing violence against Russian minorities were often accompanied by images of desecrated monuments to the Soviet Union's victory over Nazi Germany. The Russian Ministry of Foreign Affairs routinely re-tweets messages tweeted by "Russia Today" and the news service "Sputnik".

The inclusion of digital diplomacy in Russia's national propaganda efforts has led some diplomatic scholars and practitioners to wonder if Russia is ruining digital diplomacy for the rest of the world. Social media should not be used to create relationships with foreign publics that can then be used to facilitate acceptance of one's foreign policy – instead, engaging in dialogue with foreign publics should be the goal of digital diplomacy in itself. Therefore, it can be concluded that Russia's use of social media, which supplies followers with inaccurate information and portrays a distorted reality, rejects the essence of dialogic communication.


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communication as well as the transformative nature of digital diplomacy.\textsuperscript{15}

This position believes that the state should set its internal political philosophy as the goal of its foreign policy, which generally coincides with the liberal theory of international relations, which is based on the following principles: first, the rejection of power politics as the only possible outcome of international relations, calls into question the principles security/warfare realism; Second, it emphasizes mutual benefit and international cooperation; Third, it implements international organizations and non-governmental actors to shape state preferences and political choices.\textsuperscript{16}

V. CONCLUSION

Web usage ranges from e-mail, social networking, telephoning, video conferencing, reading print media, and listening to audio and visual media. It is therefore important for diplomacy to adapt to the use of web tools if it is to remain relevant in an increasingly borderless world, whose citizens are increasingly moving closer to the Internet to meet their information and communication needs. The justifications for the importance of the Web for diplomatic communication are numerous: It is a powerful tool in mobilizing people; Internet campaigns were key to stopping the Multilateral Investment Treaty in the late 1990s. It was also used to mobilize the Egyptian people in the February 2011 demonstrations against the rule of President Hosni Mubarak, who had ruled Egypt for the past 30 years. Similarly, a free online mapping tool, "Ushahidi" (meaning testimony), was used to gather information on where incidents of violence, rioting and rape occurred in Kenya, following the disputed 2007 presidential election results; using the Web and SMS functions of the mobile phone.\textsuperscript{17}

This same tool was used in Brazil and Venezuela to mobilize the masses, as well as to save lives in Haiti after the earthquake. Blogs are an effective tool in facilitating the mutual exchange of information and promoting cross-cultural communication. Email eliminates communication difficulties between embassies and headquarters caused by different time zones. The use of e-mail replaced the traditional means of forwarding hard copies of information and made communication more efficient than before, reducing the hierarchies associated with public service while speeding up the decision-making process.\textsuperscript{18}

E-mail is increasingly replacing traditional means of communication using fax or telegram when diplomats need to send written information. This made it easier to conduct diplomacy, especially when dealing with crisis situations and reporting. Emails are commonly used by diplomats from developed and developing countries. Diplomatic missions also deliver information to their home countries via secure intranets. The use of ICT has generally improved service delivery to missions that have limited staff and high requirements for providing information to the public.\textsuperscript{19}

Computer software manufacturers are increasingly introducing trust-building measures to curb hacker plots, and there is a constant production of newer versions of anti-spyware and anti-virus software. This should be supported by international legislation that regulates the use of the Internet and makes crimes committed in cyberspace punishable. Despite the positive features of ICT for diplomatic communication, governments have not yet fully embraced its use. This may be partly due to the high cost, lack of appropriate skills and the relevance of its application in developing countries with low internet penetration.

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AUTHORS

First Author – Mohamed Ali Elsherif  phd candidate
The Challenges Experience by Students in Learning English Language via Zoom Platform

(A Study Focused on Grade 10 Students in Mawanella Educational Zone)

Dr. Sumudu Ovitigama
Regional English Support Centre, Kegalle, Sri Lanka

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Abstract- The distance education has been promoted in the world after Covid-19 pandemic and Sri Lanka too was influenced by it. As a result, a popular app called “Zoom” was utilized in the field of English language teaching. Since online learning is a novelty to Sri Lankan students, it was significant to investigate the challenges experienced by them in learning English via “Zoom”. Thus, the research questions of this study were related to what challenges Grade 10 students in Mawanella educational zone experience in learning English via “Zoom” and students’ perception regarding learning English via zoom. Moreover, the benefits of using “Zoom” in learning English, the problems teachers observe related to students learning English via zoom platform and teachers’ suggestions and solutions for students’ problems related to learning English via “Zoom” too were investigated. Quantitative and qualitative data were collected by a questionnaire and an interview respectively and a mixed method approach was applied to derive the conclusion. The research sample involved 100 students and 10 teachers in Mawanella educational zone. In accordance with analyzed data it was found that more than 55% of student sample experience challenges such as signal and network issues, power cut, less face to face interaction, lack of attention, technical issues, lack of equipment etc. It was evident that the students were demotivated to learn via “Zoom” due to above mentioned problems. It was found that 84% of student sample decided that “Zoom” sessions are successful to a certain extent due to the problems they experience but 12% did not have a clear perception of “Zoom” and 41% of the student sample was with somewhat clear perception of “Zoom”. It was suggested to provide a proper training to both teachers and students regarding the facilities provided in “Zoom” app to optimize the teaching learning procedure. In addition, it was recommended to keep a recording of the lessons for the students.

Index Terms- Challenges, Distance education, English language learning, Motivation, “Zoom” platform

I. INTRODUCTION
In Sri Lanka English has been taught as a second language since middle of the 20th century (Jayasuriya, 1988; Sedere, 2008). Teaching English language includes grammar, vocabulary and four skills which are listening, speaking, reading, writing and these were mainly taught in physical classrooms before Covid-19 outbreak. In addition, up to 2019, English subject was taught in physical classrooms as interactive sessions with face to face relationship between the students and the teachers. However, in the past few years, online learning platform has been promoted as the mode of giving instructions in education system (Reimers, & Andreas, 2020). When the physical classroom became an impossibility due to various reasons, “online learning” was uplifted to be the only solution in teaching learning procedure (Wargadinata, et al, 2020). Thus, the mode of conveying instructions in education system in the world has undergone a drastic change (Dhawan, 2020, Serhan, 2020) and Sri Lanka too was influenced by this change. The scenario of teaching and learning English language in Sri Lanka too became a part of this revolution. Mainly, face to face interactive classroom was replaced by online learning platform. As a consequence, one of the major online platforms selected by teachers and students in teaching and learning procedure is “Zoom” (Dharma, Asmarani, & Dewi., 2017) . As a result, utilizing “Zoom” has become a popular tool of English language teaching and learning since the outbreak of Covid-19 pandemic. On the other hand, several researches (Lowenthal, Dunlap, & Snelson, 2017) have depicted the challenges that the students experience when utilizing “Zoom”. Therefore it is worthwhile to investigate the challenges experienced by students when they engage in learning English via “Zoom” platform.

II. RESEARCH ELABORATIONS
A. Significance of the study –
After Covid-19 pandemic, the field of English language teaching needed the support of online learning method. This revolution in English Language Teaching (ELT) field was common to Sri Lanka too and due to that fact online learning was optimized. Sri Lankan students who learn English as a second language had to select distance education mode after Covid-19 pandemic. Further, online learning is somewhat a novelty to Sri Lankan students and due to that reason most of them experience difficulties in dealing with that. Therefore, it is worthwhile to investigate the challenges faced by these students in learning English via “Zoom”. On the other hand, the investigation has its significance on making teachers and other responsible persons in the field of education aware of the problems that students face when they learn English via “Zoom”. In addition, it is expected to bring out certain kind of solutions, recommendations and suggestions to solve these problems. Thus, the responsible persons would be able to take necessary steps to develop the facilities for online learning mode. Moreover, this research is important as distance learning mode too has become as popular as physical classroom on present day. Therefore online learning is considered as an essential part in teaching learning process in current context.

B. Literature Review –

When distance learning procedure is considered, many online platforms were introduced such as Google meeting, Whatsapp, Microsoft Teams, and EDmodo. But this research focuses on “Zoom” platform and it mainly provides a learning environment very much similar to interactive classroom providing opportunities to have synchronous interaction between the teacher and the students (Rahayu, 2020). First, “Zoom” video session was with 40 minutes limit, but due to Covid-19 pandemic, this time restriction was changed for schools (Zoom video communication, 2020).

In “Zoom” platform many facilities are included for both teachers and students. Some of them are lecturing, video and document sharing, group discussion, breakout rooms, white board, annotation etc (Rahayu, 2020). Moreover, chat box, downloading and uploading documents, screen sharing and uploading homework assignments too are included in “Zoom” (Rahayu, 2020). In addition, the teachers can record the lesson for students or students later can watch the recorded lesson (McCleendon et al, 2017). The above mentioned facts are the strengths and facilities provided in learning with “Zoom”.

On the other hand, there are several researches which depict the challenges that both students and teachers face when utilizing “Zoom”. Thus, some of the reported challenges are students experiencing unreliable poor internet connection, lack of powerful speakers and microphones (Lowenthal, Dunlap, & Snelson, 2017). It is reported that as “Zoom” consists of multitasks, sometimes the sessions exceed the expected time by distracting the students (McCleendon; Neugebauer & King, 2017).

In addition, there are some learning theories which will be useful to understand the behaviour of the learners. The theory of Behaviourism explains how learner’s behaviour is changed or developed by conditioning. Under ‘Behaviourism’ two types of conditioning were presented and Operant conditioning theory (Willibey, 2019) is related to voluntary actions made by the learner. B.F. Skinner elaborates his experiment using a rat and promoted the significance of voluntary actions which are related with reward and punishment. Another useful learning theory is Cognitiveism (Neisser, 2014) which elaborates an information processing model. According to this theory a kind of brain process which transfers the knowledge from short term memory to long term memory is related to the learning procedure.

Some theories of motivation were considered to interpret certain behaviour of students who learn English via “Zoom”. They are Maslow theory (Maslow, 2013) which presents the hierarchical order of the needs of the people and Cognitive Evaluation theory (Deci, 2012) which illustrates the extrinsic motivation and intrinsic motivation. Interactionism by socio cultural perspective (Stevens, P. 2020) is a language acquisition theory which highlights how social interactionism leads to language development. All these theories supported to interpret the analysed data.

C. Research Problem –

In the past, the interactive physical classroom has been popular in the field of English language teaching in Sri Lanka. However this context was replaced by distance education mode via online due to Covid 19 pandemic. In Sri Lanka, a poplar platform selected by both teachers and students is “Zoom”. Moreover, this software has supported to optimize online learning procedure in the field of “English Language Teaching”. Although there are many teaching learning facilities provided in “Zoom”, students in Sri Lanka experience challenges when learning English via this platform. Therefore, it is anticipated to investigate the challenges face by students in Sri Lanka in learning English language via “Zoom” platform.

D. Research Questions –

This research was mainly focused on studying the challenges that Grade 10 students of Mawanella educational zone in Sri Lanka experience in learning English via “Zoom” platform. Therefore the research questions can be interpreted as,

- What challenges do Grade 10 students experience in learning English via “Zoom”? 
- What is students’ perception regarding learning English via “Zoom”? 
- What are the benefits of using “Zoom” in learning English? 
- What are the problems teachers observe related to students learning English via zoom platform? 
- What are teachers’ suggestions and solutions for students’ problems related to learning English via “Zoom”? 

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E. Methodology –

This study is a kind of exploration regarding the challenges faced by students in learning English via “Zoom”. A mixed method approach was used to collect quantitative and qualitative data. A questionnaire was administered to the students to collect quantitative data. In addition, ten English teachers who teach Grade 10 classes were interviewed regarding the difficulties faced by children while doing Zoom classes and qualitative data were collected by the interview. The interview was conducted in order to do a multiple case study. Further, the suggested solutions regarding children’s difficulties too were taken into account. The collected data were presented in tables, bar graphs and pie charts to be analyzed.

The Diagram 1 presents the research framework which includes the approach, methods, data collection and the steps of the research which lead to derive the conclusion.

The questionnaire and the interview were based on research questions. Table 1 and Table 2 showcase the relationship between the research questions and the type of data collected.

Table 1: Type of data collected to each research question

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Quantitative data</th>
<th>Qualitative data</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Challenges that grade 10 students experience in learning English via “Zoom”</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>2. Students’ perception regarding learning English via “Zoom”</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>3. Benefits of using “Zoom” in learning English</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>4. Problems teachers observe related to students learning English via “Zoom” platform</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>5. Teachers’ suggestions and solutions for students’ problems related to learning English via “Zoom”</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

F. Research sample –

In this research 100 Grade 10 students were randomly selected from 5 schools. From each school, 20 students were selected for the research sample. Therefore it was a random research sample. Mawanella educational zone in Sri Lanka was the targeted area for the investigation. Moreover, 10 English teachers who teach English via “Zoom” for Grade 10 classes from the same schools were included in the research sample.

III. DATA PRESENTATION, ANALYSIS AND FINDINGS

A. Data presentation and analysis
The Table 2 presents the percentages of positive and negative answers given by the students for binary type questions in the questionnaire.

### Table 2 - The percentages of positive and negative answers given by students for binary type questions in the questionnaire.

<table>
<thead>
<tr>
<th>Data collected from students</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Have you learnt English via “Zoom”?</td>
<td>100%</td>
<td>-</td>
</tr>
<tr>
<td>2. Do you like to learn English via “Zoom”?</td>
<td>26%</td>
<td>74%</td>
</tr>
<tr>
<td>3. Did your parents face economic difficulties in buying equipment to learn English via “Zoom”?</td>
<td>76%</td>
<td>24%</td>
</tr>
<tr>
<td>4. If so, couldn’t you buy that equipment?</td>
<td>20%</td>
<td>80%</td>
</tr>
<tr>
<td>5. Do you keep the video opened when you learn English via “Zoom”?</td>
<td>32%</td>
<td>68%</td>
</tr>
<tr>
<td>6. Do you get any opportunity to ask questions when you learn via “Zoom”?</td>
<td>84%</td>
<td>16%</td>
</tr>
<tr>
<td>7. Have you engaged in other work while learning English via “Zoom”?</td>
<td>24%</td>
<td>76%</td>
</tr>
</tbody>
</table>

In accordance with qualitative data 100% of the student sample have learnt English by “Zoom” app. In addition, 72% have been learning English via “Zoom” for one year while 16% and 12% have been learning for two and three years respectively. Moreover smart phones were used by 96% and laptops and desktops were used by 16% and 12% respectively. In considering network facilities 36% mentioned that they get it through wifi connection but 58% and 30% reported that they get network facilities by data packages and data cards respectively. Table 3 indicates the facilities provided in “Zoom” app and percentage of each facility used by teachers.

### Table 3 - The facilities provided in “Zoom” app and percentage of each facility used by teachers.

<table>
<thead>
<tr>
<th>Facilities in “Zoom” app</th>
<th>Percentage of each facility used by teachers.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Video sharing</td>
<td>74%</td>
</tr>
<tr>
<td>2. Document sharing</td>
<td>50%</td>
</tr>
<tr>
<td>3. Breakout rooms</td>
<td>-</td>
</tr>
<tr>
<td>4. Annotation</td>
<td>-</td>
</tr>
<tr>
<td>5. White board</td>
<td>-</td>
</tr>
<tr>
<td>6. None of these</td>
<td>-</td>
</tr>
</tbody>
</table>

Out of all the students 26% stated that they like to learn English by “Zoom” whereas 74% was with the negative answer. Moreover, 94% students mentioned that they prefer to learn English in the physical classroom and the 6% showed their preference on “Zoom” sessions.

### Pie Chart 1 - Students’ preference on “Zoom” sessions over the physical classroom –

According to quantitative data 76% students mentioned that their parents faced economical difficulties in purchasing equipment for “Zoom” session while 24% stated the negative answer. In addition 20% reported that they were not able to purchase it whereas 80% mentioned that they could buy it. Out of the student sample, 6% reported that their parents want them to learn English via “Zoom” while 94% reported that their parents prefer the physical classroom.

### Pie Chart 2 - Students’ perception of learning English via “Zoom”-

The students rationalized their answer by stating certain challenges they experienced in learning English by “Zoom” platform. The Table 4 displays those challenges and the percentage of students who declared them.

### Table 4 - Challenges experience by students in learning English by “Zoom”

<table>
<thead>
<tr>
<th>Challenges experience by students in learning English by “Zoom”</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Signal problems/ network issues</td>
<td>100%</td>
</tr>
<tr>
<td>2. Disturbed by power cut</td>
<td>78%</td>
</tr>
<tr>
<td>3. Less face to face interaction</td>
<td>85%</td>
</tr>
<tr>
<td>4. Lack of attention</td>
<td>82%</td>
</tr>
<tr>
<td>5. Technical issues</td>
<td>28%</td>
</tr>
<tr>
<td>6. Tired for eyes/ Small screen</td>
<td>71%</td>
</tr>
<tr>
<td>7. Teacher cannot notice the weak points of students easily</td>
<td>57%</td>
</tr>
<tr>
<td>8. Family has one equipment</td>
<td>60%</td>
</tr>
<tr>
<td>9. No way of getting clarified what students did not understand</td>
<td>64%</td>
</tr>
</tbody>
</table>

The students rationalized their answer by stating certain challenges they experienced in learning English by “Zoom” platform. The Table 4 displays those challenges and the percentage of students who declared them.

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Pie Chart 2 displays the students’ perception of learning via ‘Zoom’
Table 5: The number of teachers who found each problem of students related to learning English via “Zoom”

<table>
<thead>
<tr>
<th>Teachers’ findings through observation (The challenges experience by students in learning English language via Zoom platform)</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>T</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Students face network failure and signal issues</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>2. Students do not have the equipment</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>10</td>
<td>100%</td>
</tr>
<tr>
<td>3. Students lack technical knowledge</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>06</td>
<td>60%</td>
</tr>
<tr>
<td>4. Family has one smart phone/computer</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>07</td>
<td>70%</td>
</tr>
<tr>
<td>5. Power cut</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>*</td>
<td>06</td>
<td>60%</td>
</tr>
<tr>
<td>6. Students do not open the video</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>08</td>
<td>80%</td>
</tr>
<tr>
<td>7. Students are bored with “Zoom”</td>
<td>*</td>
<td>-</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>-</td>
<td>*</td>
<td>-</td>
<td>06</td>
<td>60%</td>
</tr>
</tbody>
</table>

B. Discussion and Findings

When the list of challenges that teachers observed in Table 5 are considered, it is very clear why students are bored with the “Zoom” lessons and why they ask teachers to repeat the same lesson in the physical classroom. This fact can be elaborated by relating it to the Maslow theory. According to Maslow, first the basic needs have to be fulfilled in order to reach the secondary needs. When the Table 5 is observed, these primary needs have not been fulfilled by the students and they were demotivated to learn English by “Zoom”. In addition, students are not extrinsically motivated by providing equipment, electricity and necessary learning environment. Therefore in return the students were not led to motivate intrinsically. B.F. Skinner’s Operant Conditioning theory illustrates how punishment decreases the behaviour. Similarly, when the students experience barriers like signal issues, network failure, power cut and lack of equipment repetitively they lose the interest towards learning via “Zoom”. As a result these students are reluctant in participating in the lesson.

Although 100% of the sample have learnt English via ‘Zoom”, only 26% of them like it while 74% indicate the negative response. As 76% of students stated that they faced economic difficulties in buying equipment, it might be one reason for their negative response. When Table 3 is observed it is evident that the
teachers have not utilized the facilities provided in “Zoom” app which are Breakout rooms, Annotation, Whiteboard etc. Therefore students too are not much aware of these facilities and due to that the students have become demotivated. Therefore it is clear why only 6% of the student sample like “Zoom” sessions. With reference to Table 4, the students stated problems such as less face to face interaction (85%), technical issues (28%), teachers’ inability to notice students’ weak points (57%), lack of opportunities to make clarifications on what students did not understand (64%), but there are facilities provided in “Zoom” app for these problems. Therefore it is clear that students are not aware of these facilities as teachers do not utilize them in teaching. According to Pie Chart 2, 84% of student sample decide that “Zoom” sessions are successful to a certain extent due to the problems they experience. Those who state that it is not totally successful (12%), do not have a clear perception of “Zoom” while those who remark that it is successful (41%) are with somewhat clear perception of “Zoom”.

I. Advantages of “Zoom” app in learning English-
This is a summary of the comments given by all the students. Accordingly, the students declared that they were able to achieve education in “New normal”. Further, they were impressed by the visual impact made through video sharing. Since the students can get the recording, they can work with their own pace and in turn it enhances the learner autonomy. In addition they stated that “Zoom” sessions offer them an opportunity to link with any teacher they like. Other than the above mentioned facts, some other benefits such as ‘dealing with new technology’, ‘time saving’ and ‘less transport expenses’ were pointed out.

II. Findings made through the interviews done with Grade 10 English teachers
The findings made through qualitative data are summarized below and the thematic analysis of qualitative data is discussed related to the research questions.
Problems teachers observe related to students learning English via “Zoom” platform-
In accordance with the analysed data collected from the interview, it is evident that 100% teachers identified three major challenges that the students experience when learning English via “Zoom”: They are network failure, signal issues and lack of equipment. When the challenges face by students are prioritized next major problem face by them is reluctance of students to open the video which indicates the percentage of 80%. Moreover, 70% teachers reported that family has one phone and students request them to repeat the lesson in the physical classroom. On the other hand, lack of technical knowledge is reported by 60% teachers. In addition, power cut and ‘students bored with Zoom lessons’ were reported by 60% teachers. When all these analysis are considered it is evident that more than 55% teachers found that there are students who experience each problem mentioned in table 5. On the other hand, when the number of students’ problems found by each teacher is considered, nine teachers exceed 50% of the total number of problems given in the chart.

III. Teachers’ suggestions and solutions for students’ problems related to learning English via “Zoom”-

The English teachers who teach Grade 10 class requested to gain a proper training on “Zoom platform”; especially on how to use breakout rooms, annotation, and video and document sharing etc. In accordance with their suggestions it is worthy to provide practical sessions for both students and teachers on how to utilize “Zoom” in teaching learning procedure. The teachers further suggested launching welfare projects to purchase smart phones or laptops for the needy students. Moreover, according to their suggestions it is better if the teachers would check the time of power cut when they schedule the lessons. On the other hand, it is difficult to handle this matter as there are disparities of power cut time from area to area. The best solution is ‘recording the lesson’. In addition, the teacher can tell the students to keep the videos on to check the students’ actual participation in the lesson. Reasons the teachers identified for children’s problems related to learning English via “Zoom”-

With reference to teachers’ observations and reports, students’ attendance for “Zoom classes is very low. It is about the half of the class. The main reason that they identified for this is lack of motivation towards utilizing “Zoom” due to economic and technological problems. Moreover as teachers too are not equipped with technological knowledge to use various facilities in “Zoom”, they were not able to motivate the students by using these facilities. Further the learners are deprived of face to face interaction. Although two sided conversation is provided by Web 2.0, the students and the teachers very rarely engage in interaction in learning English via Zoom platform. Student – student interaction too is restricted and the worst situation is that there are children who desperately gave up learning English because of the problems they experience in using “Zoom”.

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IV. CONCLUSION

With reference to the collected data, the challenges that the students face in learning English via “Zoom” can be summarized as signal and network issues, power cut, less face to face interaction, lack of attention, technical issues, lack of equipment etc. In addition, eyes of the students get easily tired because of the small screen and letters. Lack of opportunities to make clarifications and inability to notice students’ drawbacks are some other challenges found. In accordance with students’ responses and teachers’ observation it is evident that more than 55% of the sample experience all these problems. Therefore it is accentuated that more than 55% students in Mawanella zone experience above mentioned issues in learning English via “Zoom”. Further, more than 50% of student sample does not have a clear perception of ‘Zoom’ app. In addition, all the students have identified some advantages of “Zoom” app. Teachers as well as students can be empowered with a proper training on “Zoom” to get eliminated from these problems. Furthermore, all the facts, findings and suggestions mentioned in the conclusion can be generalized to Mawanella educational zone and the research topic is opened to further researches.

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Professor Seneviratha Bandara, Rajarata University, Sri Lanka

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AUTHORS

First Author – Dr. Sumudu Ovitigama, Qualifications: PhD in Linguistics (Kelaniya, Sri Lanka), M.Phil in Linguistics (Kelaniya, Sri Lanka), M.A. in Linguistics (Kelaniya, Sri Lanka), PGDE (TESL) (Colombo, Sri Lanka), B.A. (Peradeniya, Sri Lanka), National Diploma in teaching English ( Pasdunrata College of Education, Sri Lanka), Associated institute: An English Instructor and Teacher Trainer at Regional English Support Centre, Kegalle, Sri Lanka
E mail address: sumudu.ovitigama@gmail.com
Analytical Approach Towards Juvenile Delinquency

Ashmita Barthakur

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Abstract- The aim of the paper is to endeavour that Children are diagnosed world-wide as supremely belongings of the Nation. The forthcoming of the federation prevails in the arms of the Children who have been recognized as the supremely party of the predominant but because of the alienation of our society in all spheres, these future stake holders are no longer added up accurate which leads to child delinquency Child or juvenile delinquency is an alarmingly increasing trouble wreaking a source of situation in all over the world. Children ought to have been the issue of high centre of attention of development planning, research, and welfare in India however unfortunately, it has now not been no. Despite the Constitutional vision of a healthful and comfortable child protected against abuse and exploitation, and a National Policy for Children, the majority of adolescents in India continue to stay without cared, covered and significant childhood.

I. INTRODUCTION

RABINDRANATH TAGORE ONCE SAID

“A nation's children are its supremely important asset and nation’s future lies in their proper development. An investment in children is indeed an investment in future. A fit and well-informed youngster of today is the active and intelligent resident of tomorrow.”

Children are valuable treasures of the future and they are the most cherished property of a country and society. It is the work of State to inspect after them with a view to safeguard the complete development of their personalities. Since society expect that to develop as responsible residents of the future, they need different care, protection, affection and facilities due to the fact of their tender age, physique and underdevelopment mental faculties. There is no exaggeration if it is said that future well-being of a unique country depends upon how the teens develop.

ABRAHAM LINCOLN ONCE SAID:

"An infant is an individual who is going to carry on what you have started. He is going to take a seat where you are sitting, and when you are not here, attend to those things you think are major. You may accept all the policies you please, but how they are carried out depends on him. He is going to move in and take over your churches, schools, universities and corporations. The fate of humanity is in his hands."  

The matter of juvenile delinquency is no long newer. It happens in all societies easy as well as complex, that is, anywhere and anytime a relationship is affected between a group of humans leading to maladjustment and conflict.

In a developing United States of America like India the hassle of juvenile forgets about and delinquency is extensively low but progressively increasing in accordance to the National crime record bureau record 2007. What is creating problem is that the share of crimes committed by means of juveniles to overall crimes recorded in the state has additionally increased in remaining three years.

Diverse Justice Standards and Diversification of Liability: The Need

“Children need love, especially when they do not be worthy of it.”
- Harold S Hulbert, child psychiatrist

Prescribing distinct treatment for juvenile offenders is an outgrowth of the new penology, which got here to be applied with the awareness that courts, strategies and prisons meant for adult offenders may want to be hardly be predicted to serve the hobbies of the juvenile offenders. The former system uncovered delinquents to infection due to incarceration with other criminals. The nation's future citizens deserve compassion and fine care. A baby is born innocent, and accountability must be attributed to such environmental elements that have stirred his crooked tendencies, whose elimination would possibly mound him into a man or woman of stature and excellence.

The child's diminished prison capacities can be traced to the writings of thinkers like Locke. Since antiquity he was exempted from the needs of utilitarian principles, subjected to one of the kind standards of ethical evaluation. John Stuart Mill extended the applicability of his doctrine solely to humans in the maturity of their faculties, emphasizing that those in a kingdom are needed to being taken care of through others, they have to be involved towards their very own movements and eternal harm.


2 https://www.forbes.com/quotes/40/

Considering the grandeur of the problem and problems involved, evaluation shows that the broad array of factors for neglects and the delinquency are in general common and interrelated, primarily based on socio-economic and psychological reasons. Poverty, defiled homes and household tensions, emotional abuse, rural-urban migration, break-down of social values and the joint family system, atrocities and abuses by way of parents or guardians, misguided educational system, the effect of media without the unhealthy living prerequisites of slums and such different stipulations explain the phenomena of juvenile delinquency. The negligence of children upbringing by family, parents etc impacts a lot over the development of physical and mental abilities.

“Children are the most receptive^4 group in any society and in demands of special social care. On details of their vulnerability and dependence they can be abused, ill-treated and directed into undesirable channids by anti-social element in the community. The nation has the responsibility of in accordance to appropriate care and protection of young people at all times as it is on their physical and mental well-being that the future of the federation depends.”

Our Apex court docket has additionally laid emphasis on this view and observed that:

The remarkable point to observe is that a majority of the under-age population in war with law are street children. India has the biggest population with an average of youngsters as in contrast to any other country of the world. Majority of children are engaged in survival crimes, popularity offences and petty non-violent crimes. Many of them are first time offenders. Large scale of migration of households from rural to urban areas has also resulted in excessive overcrowding, dehumanizing working conditions, homelessness, deprivation, of simple services and appalling dwelling conditions in most cities.

**JUVENILE**

The juvenile has been described under Section 29B of Criminal Procedure Code, 1898 as any character who is beneath 15 years of age. In amended Criminal Procedure of Code, 1973 Section 27 corresponds to Section 29-B of the historical code and the age restrict of the juvenile was expanded to sixteen years.

The JJA^5 1986 defines juvenile in following words: ‘Juvenile means a boy who has now not attained the age of sixteen years or a girl who has no longer reached the age of 18 years.’ In JJCPA 2000, the age of a juvenile boy has been expanded to 18 years. The JJCPA^6 2000 defines juvenile in two classes particularly "juvenile in need of care and protection” and "Juvenile in conflict with law”

According to the section 2(d) of the Act, "juvenile in need of care and protection” means a adolescent

(1) Who is found with no home or a place to settle or adobe and with no avowed means of substance. [(ia) who is found desirous, or who is either a waif or working child]

(2) Who resides with an individual (even if a guardian of the child or not) as such person:
   a. Has endangered to kill or injure the child and there is a more likely reason of the threat being executed or
   b. Has previously killed, abused or tortured some other child or children and there is reasonable likelyhood of the child in question being abused, killed, or abandoned by that person.

(3) Who is mentally or bodily challenged or ill adolescent or the teen struggling from terminal diseases or incurable illnesses having no body to look or guide them after..

(4) Who has a guardian or parent and such mother or father or guardian is not fit or disabled to clout over the child.

(5) Who does not have parent, and nobody is ready to take care of or whose mother and father have deserted him or who is lacking and run-away adolescent and whose mother and father cannot be discovered after life like inquiry.

(6) Who is being or is possibly to be grossly maltreated, toured or abused for the cause of sexual abuse or unlawful acts.

(7) Who is discovered inclined and is in all likelihood to be brought about into drug abuse or trafficking.

(8) Who is being or is in all likelihood to be exploited for exorbitant gains.

(9) Who is sufferer of any amoral conflict, civil commotion or natural calamity.

According to the sec 2(1) of JJCPA 2000 Juvenile in fighting with law ability a juvenile who is alleged to have done an offence and has now not accomplished eighteen years of age as on the date of fee of such offence.

**JUVENILE DELINQUENCY**

Juvenile delinquency is a global issue. In most of the recent societies, advanced as suitably growing, this trouble is astounding and growing Nevertheless, there are divergences in magnitude of the matter regular with sociocultural and politico-economic differences within and between countries

**THE ORIGIN OF CONCEPT OF DELINQUENCY**

The phrase Delinquency is derived from the Latin phrase ‘Delinquere’ which means ‘de’ (away from) and ‘linquers’ (to leave). Thus, in earliest experience in accordance to Latin

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^7 Inserted by Act 33 of 2006.
 infinitive ‘Delinquere’ potential ‘to omit’. In Latin literature it did not observe to child behavior, however it was used with reference to the parent who omitted and deserted their adolescents.

In India the son of ‘Juvenile Delinquency’ has not been described in under any Act. Any act prohibited via law for children, up to a prescribed age restriction is juvenile delinquency and it follows therefore, that an infant located to have dedicated an act of juvenile law breaking by the bar in a juvenile delinquent. The JJPCA 2000 defines juvenile who is alleged to have dedicated an offence and has not reached 18 years of age on the date of fee of such offence. The Indian role is in consonance with the Latin principle, nullum crimen sine lege, which skill a doing cannot be considered a crime until it is so defined under the existent law. Therefore, there is no distinction between constituents of delinquency and an offence. The only difference is that a crime is dedicated by a grownup person is trial-able in ordinary courts whereas the juvenile who commits delinquent act is tried in the Juvenile Court via a distinct procedure.8

**HISTORICAL BACKGROUND**

It was Pope Clement XL, who first popularized, in 1704, the idea of the coaching and improvement of prodigal youth in institutional treatment. Consequently, Elizabeth Fry and her supporters mobilized resources to set up separate establishments for juvenile offenders. Subsequently, in British Reformatory Schools Act and Industrial Schools Acts have been delivered on statute book.

The pass to set up specific bars for juveniles was proposed, in 1847, in United States of America. However, the first Juvenile Court was established, solely in 1899, in Chicago underneath Juvenile Offenders Act. In England the first ever Juvenile court docket was structured in 1905.

The first probation regulation used to be performed in the State of Massachusetts, USA, in 1878 and in 1887 in England. The term ‘Juvenile justice’ was once used for the first time is the legislature by the country of Illinois, USA, in 1899, whilst passing the Juvenile Court Act.

In India, which has long records of Juvenile legislation, most statutory provisions have followed extra or less, the British pattern. The English notion of presenting separate therapy for juvenile offenders was surpassed on to India in the closing quarter of the nineteenth century. Prior to independence, the British rulers enacted the law for the trial of human beings who have been under the age of 15 years and had dedicated any offence. First time in the year of 1850, the Apprenticeship Act was once handed in India to deal one at a time with children.

Thereafter, the British Government enacted the Reformatory School Act, 1876 to provide that a juvenile convicted on a crook cost be admitted to a penitentiary school. But the journey revealed that these reformatory schools may want to no longer supply adequate facilities required for all spherical development of a child. Therefore, provisions have been involved in the Code of Criminal Procedure 1898 to area formative years upon the age of 18 years in a prison school. Thereafter, in accordance with the Indian Jail Committee Recommendation (1919-20) comprehensive Children Act had been enacted in provinces of Madras (1920), Bengal (1922) and Bombay (1924). The idea of juvenile justice was discovered in this manner.

Post-independence, when Constitution of India was once being enacted suitable cares have been taken for juvenile by imposing the following Articles of the Constitution a foremost accountability on the State to ensure that all developmental needs of the youth9 are met with and that their primary human rights are covered:

Article 15 (3): Allows the state to make idiosyncratic provision for adolescents and females.

Article 23: Forbids the traffic in human beings and forced labour.

Article 24: Forbids the employment of adolescents under the age group of 14 years in factories, mines and other hazardous occupations.

Article 39 (e): Guides the state to safeguard the delicate age of children from in-flowing into, jobs inappropriate to their age group and forced be economic necessity,

Article 39 (f): Directs the state to secure facilities for the healthy growth of the children and to protect childhood and youth against profiteering and moral and material negligence.

Article 45: Requires the state to provide the free and compulsory education to all children till the age group of 14 years.

Article 47: It the culpability of the State to cater with a better level of nutrition and standard of living.

Considering the Statutory provisions and to furnish a uniform central regulation for adolescents in the Union Territories, the Government of India enacted Children Act, 1960 for Union Territories, which used to be also supposed to serve as model regulation for different States, to deal with the destitute and delinquent teenagers10 one at a time via specialized institutions. The Act was ameliorated in 1978 to make it greater efficacious. The aim of JJA 1986 used to be to segregate the unnoticed juvenile from the delinquent juvenile and to grant remedy and coaching to the one-of-a-kind categories of adolescents separately, viz. in juvenile properties and exclusive homes. The Act was no longer appropriately implemented, and it did no longer provide for any distinct provision for kids who had been in the want of care.11

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9 Caldwell: Criminology, p-357
10 Black law dictionary of 1999, the seventh edition, west group.
11 The Govt. of India additionally enacted at unique point of time. It added a few legislations for the safety and improvement of children. The Guardian and Wards Act, 1890, Hindu adoption
II. CHAPTER 2

INTERNATIONAL AND NATIONAL CONCERN OF JUVENILE

As observed herein above the journey of imposing the Central and State Children Acts over a large period, it used to be felt that there was once a deficiency of consistency in the provisions of the Children Acts. No minimum well known for primary needs, living conditions, therapeutic offerings etc. have been maintained under the Children Act, 1960 programmers.

Therefore, retaining in view the United Nations Standard Minimum Rules in consideration of organisation of the juvenile justice (Beijing Rules, 1985), the Government of India enacted the Juvenile Justice Act in 1986, by the Parliament and got here into pressure on 2nd October 1987, for the complete USA to supply for the care and concern, safety, treatment, growth and rehabilitation of not noted and delinquent juveniles and for the adjudication of sure things pertaining to delinquent juveniles thereby presenting a uniform regulation on juvenile justice for the complete country.

The first uniform law on juvenile justice alternatively did not end result in any dramatic meliorism in the therapeuticics of juveniles. There was once a wide gap between the cherished principles and the proper practices beneath the JJA 1986. Most of the states have now not set up the fundamental infrastructure consisting of juvenile welfare board, juvenile courts, remark homes, juvenile homes, different properties and after care homes.

Despite obligatory requirements, the minimal requirements for institutional care in time period of accommodation, maintenance, education, vocational training, or rehabilitation were no longer spelt in most of states. There was once no particular policy toward the manpower improvement of the juvenile judicatory structure.

In 1985, The UN Standard Minimum Rules for the Government of Juvenile Justice (the Beijing Rules) was once framed and it emphasized on the accountability of workout of discretion referring to adolescents and observance of primary procedural, shield at all tiers of objections, apace with the goal of ‘promoting juvenile welfare to the biggest possible extent’. The basic concepts under the Beijing Rules are:

a. That the response to juvenile offenders ought to constantly be in percentage to the occasions of twain felons and the offence.

b. That the placements of the juvenile in an institute have to be a propensity of last inn and for the minimal necessity period.

c. That the detention pending trial has to be used solely as a means of last resort and for the shortest feasible period;

d. That police officers dealing with juvenile have to be mainly trained and instructed.

ENFORCEMENT OF JJA. 1986

We have observed herein above, the journey of enforcing the Central and State Children Acts over a massive period, it used to be felt that there was once a lack of consistency in the amenities of the Children Acts.

and Maintenance Act,1956, Orphanages and Other Charitable Homes (Supervision and Control) Act, 1960- to grant for the supervision and looking after the orphanages which are houses

No minimum well known for primary needs, residing conditions, therapeutic offerings etc. were maintained below the Children Act, 1960 programmers.

Therefore, maintaining in view the United Nations Standard Minimum Rules in consideration of organisation of the juvenile justice (Beijing Rules, 1985), the Government of India enacted the Juvenile Justice Act in 1986, by the Legislature and came into pressure on 2nd October 1987, for the complete United States of America to supply for the care and concern, safety, treatment, growth and rehabilitation of overlooked and young lawbreakers and for the adjudication of positive things bearing on to delinquent juveniles thereby supplying a uniform regulation on juvenile judicatory for the entire country.

The JJA 1986 envisaged a comprehensive strategy closer to justice for adolescents in situations of abuse, exploitation and social mal-adjustment and to set forth a consistent legal foundation for juvenile judicatory in the country to make certain that no adolescent underneath any circumstances is lodged in detention centre or police lock-up.

The JJA 1986 changed the common mechanism for dealing with youth in conflicts with regulation below the number Children Acts in the States and Union Territories.

SPECIAL FEATURES OF THE JJA 1986

The JJA 1986 aims at reaching the following objectives:

- It affords for continuation of inquiry if a juvenile ceases to be so for the duration of pendency of lawsuits and for determination of lawsuits as if the juveniles continue to be so.

- The distinction between bailable and non-bailable offences has been overlooked in case of offences by juveniles and all juveniles are entitled to be released on bail irrespective of the offence charged.

- Delinquent no longer to be sentenced to death or imprisonment or dedicated to jail in default of payment of excellent furnishing sureties.

- No juvenile to be saved in penal complex or police station below any circumstances.

- To supply for a specialized strategy toward the prevention and cure of juvenile misconduct in its full realm in maintaining with the improvement wishes of the adolescent found in any position of social maladjustment.

- To establish measures and necessities for the organisation of juvenile judicatory in phrases of analysis, investigation and pursuit, pronouncement and disposition and concern, treatment and rehabilitation.

- To improve suitable liaisons and orientation amongst the legal system of juvenile judicatory and voluntary organisations involved in the welfare of disregarded or society maladjusted teens and to in particular describe the spheres of their duties and roles. To represent one-of-a-kind crimes in reference to juveniles and supply for punishments therefore.

CHILD IN DISCORD WITH THE LAW

for ignored teens and establishment to penalize the criminal aspects indulged in the same.

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Whatever is the nature of the offence, the infant must be released on bail regardless of surety. If capricious situations call for detention it must be in an observation home, no longer jail or police station.

The Juvenile Justice Board that consists of two communal employees and one magistrate has the discretionary electricity to ship the adolescent home after consultation or admonition or order him or her to perform society service or release the adolescent on probation. (Section 15).

An adolescent cannot be termed sentenced to life imprisonment or death or committed to jail in failure of non-payment of penalty or furnishing of safety. (Section 16).

No adolescent shall suffer any disqualification attaching to a conviction. After a lifelike length of time the documents of the conviction ought to be removed. (Section 19).

No adolescent shall be tried with an adult. (Section 18).

The act also safeguards the privacy of the adolescent. No media report might also carry ciphering out specifics or particulars of an adolescent in struggle with the law or a teen in requirement of concern and protection. (Section 21).

III. CHAPTER 3
CHILDREN IN NEED OF CARE AND PROTECTION (CNCP)

Adolescents are the naivest section in society. They are dependent, have the least power, and have less manipulation over their personal lives. Among teenagers there are some who are greater marginalized and not looked after than others because of their socio-economic cultural circumstances. These children are viewed as Adolescents in dire Need of Care, Concern and Safety.

These Children in Need of Care and Protection (CNCP) are determined in the following situations:

1) In Families at Risk
2) On the Street
3) In Institutions

Such a character is unable to function fully or in part the functions of a regular non-public or communal way of life due to the fact of a congenital disability or a lacking in his/her physical or intellectual capabilities.

1) MENTALLY ILL CHILDREN

A mentally unwell child is any man or woman under 18 years struggling from an intellectual illness. The time period intellectual illness consists of several psychiatric disorders. It's a disease that attacks the general performance of the infant. The ill-health differs in severity ranging from no manifested signs to being extremely baffled, depressed, disturbed or withdrawn. It may additionally have an effect on the way the adolescent acts or communicates with different people. Mental illness12 is incapacity and youngsters with this condition reply nicely to therapeutics. A few of the mental ailments and behavioural issues encountered are: enuresis, thumb sucking, fumbling while speaking, nail biting, lying, larceny, schizophrenia, suicidal tendencies, acute depression, psychosis.

2) HIV / AIDS, AFFECTED / INFECTED CHILDREN

HIV/AIDS are pretentious endemic extent and are of severe concern. Children with HIV/AIDS are most regularly victims of situations and might face the societal abandonment show casted at individuals with HIV and their families.

Some of the youth who are greater susceptible are:

1. Adolescents who are assured as infected through the virus
2. Children who are born as HIV positive as they caught the virus in the mother’s womb.
3. Children who needed blood donations due to some illness.
4. Children addicted to drugs.
5. Adolescents who are sexually maltreated and exploited.
6. Children affected the place mother and father /siblings are HIV positive.
7. Children prone to HIV in high hazard communities.

Some of the issues encountered are:

1. Prejudice and social exclusion main to inequity, profiteering and abuse.
2. Denial of access to schooling.
3. Denial of access to schooling.
4. The infected parents earning capability reduces.
5. The young people ought to inn to earning due to economic pressures,

3) JUVENILES IN DISCORD WITH THE LAW

Children in fighting with the judicatory system are males and female who are not eighteen years of age, doubted to have committed crimes and have been held into duress by means of the police below the insight of the Juvenile Judicatory Order. Children are inclined to derisive terrible situations are influenced frequently by way of adults to have interaction in crime.

A few of the crimes could be:

- Robbery, larceny and petty thefts Murder.
- Rape/molestation & sexual abuse.
- Causing grievous damage or harm to another.
- Other minor offences.

Some of the elements that topped to juvenile offence are:

Poverty

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12 Similar conclusions can be strained in the juvenile justice field regarding delinquent behaviour.
Poverty bereaves teens from socio-cultural and financial opportunities for development and advancement. Poverty associated situations like serious hunger situations, ill-health, addictions, parental neglect, worsen the situation. Such kids are at greater hazard than other people of being conscripted into criminal offences.

**Family**

Criminal acts of family participants impact kids and from time to time they themselves induct young people into offences. Lack of terrific education and self-discipline. Inconsistent orderliness, parental alienation, derisive can cause a terrible self-image and personality issues, letting kids get inclined to toxic manipulations backyard the home.

**4) SHOULD JUVENILE OFFENDERS BE CHARGED AS AN ADULT**

People these who are in support of abolishing juvenile courts and juvenile justice system argue that those juveniles’ who are found responsible of prison or have been charged for murder must be tried in adult criminal court. Many states have exceeded legal guidelines making it less difficult to attempt sure juveniles as adults.

They assert that it is immoral to subject adolescents to person punishments as it is ineffective and leaves psychological scars on juveniles two which leads the juvenile to re-offend. Furthermore, community leaders and social people superior the thought that the juveniles’ offenders are vulnerable and immature they need suitable guidance, safety and socialization of adults.

**5) FUNDAMENTAL PRINCIPLES**

The critical principle of juvenile justice device has been laid down in Rule 3 of the Juvenile Judicatory (Care and Protection of Children) Rule 2007. The State Government, the Juvenile Justice Board, the Child Welfare Committee and different in a position authorities or corporations while performing their obligations shall abide and be guided through these principles.

These ideas are:

**Principle of presumption of innocence**: A juvenile in battle with regulation is presumed to be innocent of any mollified or crook intent before attaining the age of eighteen years. The fundamental factors of presumption of innocence are:

(i) Age of innocence;
(ii) Procedural safety of innocence; &
(iii) Provisions of Legal aid and guardian ad litem.

**Principle of dignity and worth**: Treatment that is regular with the child’s experience of dignity and really worth is a crucial precept of juvenile justice. The juvenile’s right to dignity and self-worth has to be revered and covered for the duration of the entire structure of dealing with the adolescent from the first association with legal enforcement businesses to the implementation of all measures for dealing with the child.

**Principle of Right to be heard**: Every adolescent’s way to express his views freely in all matters affecting his activity shall be absolutely respected via each and every stage in the procedure of juvenile justice.

**Principle of Best Interest**: In all selections taken inside the context of administration of juvenile justice; the precept of enjoyable pastime of the juvenile in discord with legislature must be the primary consideration.

**Principle of family responsibility**: The main duty of bringing up children, presenting care, help and protection shall be with the birth-parents. However, in high-quality situations, this duty might also be bestowed on inclined adoptive or foster parents.

**Principle of Safety**: At all stages, from the preliminary contact until such time he stays in association with the concern and safety system, and thereafter, the juvenile shall not be inflicted to any harm, abuse, neglect, maltreatment, corporal punishment or solitary or otherwise any confinement in jails and severe care shall be taken to avoid any damage to the protection.

The Rules framed below the act mainly mention in element to take care of setting up of remark properties and distinctive residences for young males and females with separate residential facilities for extraordinary age groups. The Rules specify the general aspect of care to be taken while dealing with the children. They provide that the houses for ‘Juvenile in Conflict with law’ and for ‘Children in Requirement of Care and Protection’ are supposed to function from separate premises.

Recent changes in JJS13 treat adolescents in begging and prostitution as youngsters in need of care and protection, but the corresponding alternate in mindset has yet to come about at all levels. Thus, it seems from the instances came in front of the law and the committee, that most of the time adolescents in war with law come out of the wider category of adolescents in want of concern and safety, the crying need for the device is to treat the former in the identical method as the latter, with a light contact of the law and with the benevolence and dignity that they possibly by no means obtained before.

**CRITICISM AGAINST JUVENILE JUSTICE (CARE AND PROTECTION OF CHILDREN) ACT, 2015**

Within the Lok Sabha in May 2015, Shashi Tharoor, an INC Member of the Parliament (MP), alleged that the governance was once in contradiction with worldwide requirements and that most youngsters who break these regulations come from poor and illiterate families. He stated that they ought to be trained rather of being punished.

However, some sections in the society felt that in view of terrorism and different serious offences, Juvenile Justice Act of

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13 Juvenile Justice System.

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2000 needed to be amended to encompass punitive processes in the existing Juvenile Justice Law, which we a long way in in basic terms rehabilitative and reformatory. Some argued that there is no need of tampering with Juvenile Justice Act for putting up remarkable deterrent towards terrorism.

INTEGRATED CHILD PROTECTION SCHEME: ICPS

The hassle with these alterations is that they are however always at the legislative level, and may additionally not truly be implemented. The Integrated Child Protection Program will with any luck tackle implementation concerns, through a completely new bureaucratic structure and improved costs for child protection. Set to be finished over the route of the next Five-Year Plan (2007-2012), the ICPS will create new offices recognized as State and District Child Protection Units. These Units are meant to be both the supervise our bodies as properly as the chief funding useful resource for all Observation Homes, Juvenile Justice Boards, and Special Adolescent Police Units. However, it is ambiguous whether or not these Units will be able to be independent, as they are nevertheless below the Ministry's umbrella and organizational hierarchy.

NGOs fear this to be an effective solution, as it will tend to lead to political appointments of human beings who may additionally no longer have the suited education or commitment to the position

The Model Rules and the ICPS both are presently in draft form, and the implementation and effect of these adjustments is unclear. The Government of India is advancing these options in order to improve a failing system, but each requires sizable dedication and engagement from each state governments and civil society. In order to see real change, the Government will require assessment from the NGO neighbourhood and the public at massive to form the vital exterior motivation that will transform these files into reality.

NATIONAL COMMISSION FOR CHILDREN

A countrywide commission for children's welfare was recommended with the aid of the high-level committee constituted by means of the Apex Court in a public interest petition for simple facilities for adolescents associated in the fireworks production in Madras and Sivakasi in the prior 1990s. The authorities have reiterated its wish to represent one on numerous activities subsequently, but one has nevertheless to be constituted. It is essential to constitute the national commission for adolescents for focusing and evolving programmers for all categories of children; coordinating a variety of programmers; challenge follow-up of its tips with a range of different bodies and departments; for creating a database for policy formula and review; in sum, to be worried exclusively in programmers and prospects concerning to improving the growth opportunities for each child, not restricted to young people protected in the JJS.

CHAPTER 4

JUVENILE JUSTICE SYSTEM IN UK, U.S. AND INDIA

INTRODUCTION

Every adolescent inherits a right to happy, delightful and euphoric adolescence, the correct to way to develop in an innocent and subsistent surrounding, the freedom from all complexities and disturbance of life etc however there are a few unfortunate and doomed teenagers who are disadvantaged of these matters and they grow up to be teens now not desired for or to time period its different way juvenile delinquents. Juvenile delinquency essentially can be intended as a capricious and disapproved conduct of teenagers which is now not accredited by using society and in the activity of the communal some sort of reproachment, rebuke, term penalty or corrective norms is given to the adolescent to rectify them. These juveniles are no longer mature enough to recognize the repercussions and result of the crime they have dedicated and in legislature such people are viewed as doli incapax which means thereby unable of carrying out an offence.

POSITION IN UNITED STATES

In his commentaries, Blackstone had talked about human beings who were incapable of carrying out an offence. To commit crime men-rea and actuaries are the two indispensable elements. For the favour of any of these offences, a man can't be held liable. According to Blackstone, teens ought to be distinguished into two divisions. Adolescents who are below the age of seven years are doli incapax i.e., unable of carrying out an offence and teenagers above the age of fourteen years. In case they carry out an offence, they would be conducted in the same way as a person i.e., no difference between an adolescent who is above fourteen years carrying out an offence and a major held guilty of offence as both of them would be handled at par.

The first ever Juvenile Court in the United States (US) came into existence in the 12 months 1899 in Cook County, Illinois. After this within a span of 25 years most states in US had set up juvenile courtroom system. As a long way as these early juvenile court structures have been involved their essential purpose was to rehabilitate and reform the culprit rather than impose punitive and penal measures on them. In the rehabilitative model of juvenile system, the immaturity of younger offenders performed a vital role.

The Juveniles require exclusive cure to rectify them and consequently their correctional strategies ought to additionally be specific from adults. Both of these can't be dealt with at par. The protagonist of this additionally believed that the criminal acts dedicated via younger offenders reflect their immaturity and hence similar system and punishment should no longer be meted out to the juveniles as is served on the adults.

At the present, in the United States, motto ‘adult crime adult time’ is being adopted. In 38 states of US, upper age of juveniles is seventeen years whilst in other three states it is fifteen years. There is unanimity in nearly all US States on the factor of making an attempt juvenile at par with adults on juvenile accomplishing fourteen years of age, in sure situations barring states like Vermont, Indiana, South Dakota where a kid of even ten years can be tried as adult. As far as the jurisdiction phase is

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14 Offences in India 2009: ‘crime against children’, National crime record Bureau, Ministry of Home Affairs, Govt. of India.
worried if an adolescent commonly 13 or 15 commits a grave and grim crime then their case is mechanically shifted to adult court. Jurisdiction of such juvenile courts is automatically relinquished in such cases.

**POSITION IN INDIA**

As of here as the function of Juveniles as India is involved with, acknowledging that ages there has been a style of imparting unique treatment for juvenile offenders. In the year of 1843, i.e., for the duration of colonial regime, Lord Cornwallis hooked up Ragged School for such children. The Apprentice Act 11, which talked about juvenile rules, got here in the 12 months in the 1850s. After a decade, Indian Penal Code used to be legislated. Though the Code did not particularly talk about Juvenile offenders however there are such provisions in the Code which offers with underaged criminals. According to the Section 82, IPC\(^\text{15}\), teenagers who are much less than the age of seven are doli incapax i.e., those adolescents are incapable of committing crime. They do not have men rea or any intention of committing a crime. Section 83 efficiently talks about youngsters between seven to twelve years of age.

These teenagers whilst committing crime if they can apprehend the nature of crime, they are punishable. Additionally, sections 27 and 360 of CrPC\(^\text{16}\), 1973 also discuss about younger offenders.

In the year 1876, then came in the Reformatory School Act of. After this Act came into force, the Reformatory Faculty Act of 1876 and 1897 were the successive achievements for redress of young offenders in India and with it there formerly was a shift of penal philosophy from punitive to detention centre measures i.e., now the predominant intention was once to reform the juveniles instead than imposing punitive measures on them.

The existing juvenile justice gadget is governed in reference to a number of International Covenants. For instance, the following: the UN Conventions on the Rights of the Child (CRC), The UN Standard Minimum Rules for administration of Justice (Beijing Rules). Also, in India Article 15(3) of the Constitution talks unique provisions for children. This article has been specifically framed in the charter for protection of children.

Not only this, Article 21, 23 and 24, offers with indispensable rights and are also available to children. Additionally, Article 39(e) and (f) and Article 45 additionally talks about children.

The Juvenile Judicatory (Care and Protection of Children) Act was enacted in the year 2000 in 12 months. The Act affords that an adolescent who has no longer attained the age group of 18 is a juvenile.

This act of the 2000 has been amended various instances in the following years 2006, 2010 and 2011 i.e., in the years 2006, 2010 and 2011 amendments have been made. The 2006 Amendment Act protected 26 amendments.

**POSITION IN UK**

We should no longer be surprised if ‘the penalties are more difficult when we have been given the opportunities but don’t take them.’ -Prime Minister Tony Blair

The UN Convention on the Rights if the Child stipulates that teen ought to be covered from custody on every occasion viable and when deprived of liberty have to be handled with humanity and respect. In Article 37 of the conference, it is noted that imprisonment of a child shall be used solely as a measure of ultimate comfort and for the minimal convenient duration of time. Juvenile crime and the term of punishments can be special from the kinds of punishments that are ordered in person criminal cases. The first court docket mounted expressly for juveniles was constructed in Chicago in 1899 to tackle the trouble of juvenile crime and punishments. Juvenile crime and punishments peaked in 1994. The 1990s noticed a swell of public scrutiny over the perceived juvenile crime epidemic. In an effort to crack down on juvenile crime and punishments, many kingdom legislatures have adopted harsher legal guidelines involving juvenile crimes. The 1908 Children Act created a separate and wonderful machine of justice board on the juvenile court; the 1993 Children and Young Persons Act formally required the court to take account of welfare consideration in all cases involving young offenders, and the 1969 Adolescents and Juveniles Act recommended the phasing out of criminal in favour of civil proceedings. England and Wales' adherence to ideas of children’s rights without a doubt does now not certainly avert the pursuit of policies with exacerbate structural inequalities and punitive institutional regimes.

**VITAL SECTIONS OF THE JJCPA AMENDMENT ACT 2006 ARE REPRODUCED HERE IN BELOW**

- **Section 2(a)(a)**
  - Incorporation of the definition of the word Adoption: ‘Adoption’ is the capability of the method via which the adopted child is completely disassociated from his birth parents and will become the reliable adolescent of his parents who adopted him with all the rights, perks and obligations that are connected to the relationship
  - **Section 2(d)(i)**
    - Child beggars to be covered in the definition of adolescents in want of care and protection.
  - **Section 10(1)**
    - In no situation should a teen in hostilities with regulation shall be put in a police lockup or domiciled in jail.
  - **Section 14(2)**
    - As the provision for inquest is to-be accomplished in a period of four months, it lacks acceptable application, as inquests are awaiting before the Juvenile Boards for a long length of time, it is proffered that the Chief Juristic or Metropolitan Magistrate shall assessment the pending of the instances of Board in each six months, and must supervise the Board to expand the persistence of its sessions of might also motive composition of supplementary Boards
  - **Section 15(1)(g)**
    - The Board of Juvenile Judicatory can pass an order leading the juvenile sent forth to one of kind home for a maximum duration of three years only.
  - **Section 16(1)**
    - No adolescent in encountering with regulation can be put underneath the span of imprisonment for any time period which may also prolong to imprisonment for life.

\(^{15}\) Indian Penal Code, 1860.


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• Section 21
Breaching regulations which deals with prohibition of book of identify etc. of child/juveniles shall be punishable with first-rate perpetual to Rupees 25,000 as in opposition to existing Rupees 1000.
• Sections 4 & 29
The State Governments are to represent the Board of Juvenile Judicature and the Children Welfare Committee for each and every locality in not more than one year of the Amendment Act coming into play.
• Section 33(3)
The Governments of State may also overview the pending of the precedents before the Child Prosperity Committee so as to make sure of the expeditious culmination of the enquiry process
• Section 34(3)
All the State Governments/voluntary enterprises going for checking ups to institutions for a child/ juvenile must be certified under the foundations of the Act in a duration of six months from the day and date of initiation of the Amendment Act, 2006.
• Section 41(4)
Government of State must comprehend one or more of its organization or voluntary organizations in each and every district as specialised adoption business for the placement of orphans, abandoned or surrendered adolescents for espousal. Children’s properties and the institutions run by way of the State Government or voluntary businesses for adolescents who are orphans, abandoned or surrendered shall make certain that these teens are declared free for adoption by way of the Children Welfare Committee and all such instances must be adverted to the adoption organization in that district for the placing of such youngsters in adoption in accordance with guidelines.
• Section 62(A)
Every Government of State must constitute a Child Protection Unit for the Territory and, such units for each and every district, consisting of such officers and other employees as might also be appointed with the aid of that Government to take up matters touching on to youngsters’/juveniles with a view to make certain the implementation of this Act.

CASE OF SHILPA MITTAL vs STATE OF NCT OF DELHI
In the case of Shilpa Mittal vs State of NCT of Delhi17, the question of whether or not a child shall be prosecuted as an adult arose before the court.

In the above-mentioned case, the child had committed the offence when he was above the age of 16 years but had not reached the age of 18 years. It was directed by the Board of Juvenil Judicature that the adolescent must be prosecuted and punished as an adult as the offence committed by the teen was a serious one. On such happening, the High Court was approached by the mother of the child on the following ground that duration of punishment for that crime was not given under the Section 2(33) of the Juvenile Justice (Care and Protection of Children) Act of 2015. It was expressed by the High Court that as the child has committed a serious crime because of which he could be prosecuted as an adult and hence punished accordingly as that of rape and murder. The punishment for such offences is more than a period of 7years. Therefore, an appeal was later filed before the Apex Court as the order seemed antagonistic. It was further held that the aforesaid Act has no involvement with the fourth category of crimes that is culpable for 7 years or more but at the same time they do not contain any provision of minimum punishment or punishment which is lesser than 7 years. Therefore, such offences are known as ‘serious offence’ under the Act. Such type of matter should be accordingly approached with such procedure lest the Parliament deals with it by itself. The issue was further given in favour of the teen and the High Court was directed that the name of the teen should be taken out from the Child in Conflict with law.

JUDGEMENT OF THE SUPREME COURT
On determining Section 2(33) which is read along with the following sections- 14,15 and 19 of Act, it was concluded by the Court that the intention of the Legislature abaft the Act was in regards to keep up the statute in the in the most excellent concern of the adolescent by framing an encircling procedure to be pursued before prosecuting the adolescent as an adult.

In consequence, the Supreme Court adhered those crimes which do not provide in a merest term of 7years but a maximum term of punishment of more than 7 years cannot be contemplated as a ‘heinous offence’ and they will rather fall under the purview of ‘serious offence’ in the meaning of the ACT and deal with the Parliament accordingly till a call is taken on the issue.18

SUGGESTIONS AND REMARKS
The concern in view of this is not really about the embodiment of the ‘fourth category’ crimes under the JJ Act,2015, instead it moves in the scenario through the lens that the vagueness formed by the Legislature can be abused in similar future issues.

The downfall of the Legislature in differentiating offenses and recognising them under serious or heinous crimes can sometimes leave the complainant in anguish and disappointment with the Justice system for enunciating such judgement which is nowhere related to what the complainant must have expected from the justice system.

For the crimes where either the maximum or minimum term of punishment is arbitrary, the ambiguity formed within gives away a braid prudence to the judges while pronouncing sentences that will be put to use according to their own decision. Hence, the enactment of a homogeneous sentencing foundation can be more efficient to plug the cracks of the issue via this case and likewise19.

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17 The adolescent is treated differently from the adult. Various judgments state that the teen would be regarded as abandoned if they are not cared for by their parents.

18 Legislatures have taken immediate steps to ensure that the rights of the teens are protected.

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19 Various educational programs, counselling workshops, and developmental activities are conducted to promote values among these children.
IV. CHAPTER 5

RECOMMENDATION AND CONCLUSION

The profile of teens in India exhibits that a majority of them are living in prerequisites of a very disadvantaged primary survival, subsistence, and developmental opportunities. High charges of infant mortality, school dropouts, child labour, handicapped children, and the predicament of juvenile delinquency are indicators of the requirement for intervention via the state.

Protection and child concern had been usual as duties of the present-day welfare nation but have endless responsibilities of the state with the shift from welfare to rights for pleasing the wants of adolescents following the UN Convention on the Rights of the Child. Through social welfare programmers and the JJS, states have initiated the duty of ensuring developmental possibilities to adolescents residing in conditions of choose and showing symptoms of social maladjustment.

This assimilation began with the hypothesis that the malfunctioning of the JJS in India has been prompted by way of a non-systemic approach to the JJS and set out to discover out the motives for the same. The examination of the profile of juveniles, historic developments, normative structure, legislative and judicial processes, and implementation sample include now not solely innumerable and incontrovertible proof of a non-systemic and fragmented strategy to the JJS which resulted in the malfunctioning of its a variety of organs, however additionally also the motives for it.

The following coverage statements emerge from these objective statements:

- The nation is committed to ensuring care and protection to all youth who can also want it.
- The country has made a coverage shift in recognizing that fulfillment of the fundamental desires of the youngsters in the proper means of all the children. It accepts that the wants of teenagers for care, protection, development, and growth in an environment of love and affection are their rights and no longer only welfare function of the state.
- The nation shall discover the integral resources to fulfil its responsibilities below the new legislation.

The JJA failed miserably each of these counts. The JJCPA is even more ambitious. It has extended the sphere of the law in inclusion by means of widening the definition of adolescents in need of safety and concern barring any additional economic commitments from the nation and this is feasible to meet with the alike destiny as its predecessors on the implementation front. Ancient vogue has shown that the growth of juvenile justice in India has no longer been a constant process backed up by means of scientific evaluation of the constructive pattern. It has been an end result of periodic problem generated through situations or national or global occasions.

Foster care, adoption, drop-in centres, and sponsorship are amongst the measures now integrated in the legislative scheme for providing care to children, however the manner in which these provisions are operationalized underneath the regulations will decide the extent and manner of the actual community participation in the implementation of the JJ (C&P)\(^{20}\) Act. The JJA, too, had provisions for the neighbourhood cooperation, however the application pattern till date has not proven the intensity of neighbourhood participation to the extent it may have been beneath the until now legislation.

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\(^{20}\) Juvenile Justice (Care and Protection of Children) Act, 2015.
The Environmental Formation of the Egyptian Office Buildings Envelopes in order to Develop its Architectural Design

Essam El-din Badran Abou Al-Einen *, Faysal Mahmoud Abou El-Azm **, Hadeer Abd Al Ellah Ibrahim **

*Professor at Department of architecture, design, and urban planning, Suez Canal University, Ismailia, Egypt
** Associate Professor at Department of architecture, design, and urban planning, Suez Canal University, Ismailia, Egypt

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Abstract- The formation of the external envelopes and its impact on energy and environment is one of the most important factors that affect the quality of the work environment in the office buildings. Since, the industrial revolution and the era of high technology, buildings facades have witnessed a significant and noticeable development. The building skins represent the link between the internal environment (internal architectural spaces) and the external ones, and it also has a major role in controlling the internal climate and creating a micro-environment that meets the expectations of the users and their needs, by controlling the internal environment and providing comfort (psychological, acoustical, visual, thermal, ventilation and lighting comfort).

Index Terms- Architectural Formation, Envelopes, Environmental Design, Office Buildings, Egypt

I. INTRODUCTION

In order to learn about the styles and patterns of the office buildings in the local environment, a visit to the smart village and the Fifth Settlement was made, and it was found that most of the buildings were designed separately from their environment, blindly imitated similar to the trendy office buildings around the world as shown in fig (1). This resulted in many problems in the internal environment (internal architectural spaces), such as the lack of the comfortable and stimulating environment for employees, low productivity and the symptoms associated with the sick buildings, as well as the impact on the external environment, such as the separation of buildings from their original cultural identity and their society.

Figure 1 The similarity between the envelop of the National Bank (NBK) in the Fifth Settlement and Bank building located in Manhattan, New York, United States (right), The similarity between BLOM Bank Egypt SAE in the Fifth Settlement Bank and Bank building in Minneapolis, USA (left).

I. RESEARCH PROBLEM

The separation of office buildings from their environment and identity, and the problem of the energy economics in Egypt fig (2). Therefore, the main aim of the research is to answer the following question, "Is the environmental formation of the building skins is the target or one of the ways that should be used to develop and improve the architectural design of the office buildings?". With the
energy problem and the high operating costs afflicting Egyptian administrative buildings, it was necessary to study the methods and techniques used to deal with the problem of the operation and maintenance costs by reducing energy consumption in the buildings and adopting effective and negative environmental design strategies in the external envelopes.

II. BUILDINGS ENVELOPES ADAPTABILITY

A. The Similarities between Nature and Buildings Envelops
The most important features of the adaptive envelopes are the responsive process (responsiveness) fig (3) to all the various internal and external variables in order to reach the best performance of the building and meet the different user’s needs.

Figure 3 The phenomenon of respiration in plants (right), The breathing buildings envelopes, the Hamburg concert hall (middle), Detailed vertical section of the envelope (left). source: (Schittich, 2015).

B. The Similarities between Human Being and Buildings Envelops
The vital systems in the human body such as the respiratory system and the breathing process are similar to the ventilation system and the fresh air cycle inside the building fig (4), and the structural system of the building is similar to the structural composition of the human body.

- The Similarities between the Adaptation of the Buildings Envelopes and the Human Skin
The building's envelope resembles the human body and is one of the best biological comparisons for buildings fig (5). The

Figure 4 Automatic reaction in the human system (right), Automatic response of sun louvers to sunlight (left). source: (Schitlich, 2015).

Figure 5 Sensory receptors in human skin (right), Sensory receptors in buildings (left). source: (Gün, 2013).
envelopes protect the building just as the skin protects the human body, and it covers the building just as the skin covers the human body. The term “Building Skin” was invented because the building’s external envelope resembles human skin, which protects the body from cold, heat, and bacterial and chemical threats. The live receptors found in the human skin that respond to stings and pricks, for example, are similar to sensors that detect clouds, rain, theft and fire. These sensors are installed in the building.

III. CASE STUDY: HC SECURITIES & INVESTMENT SAE, EGYPT

A. THE ANALYSIS OF THE BUILDING BEFORE RENOVATION OF THE EXTERNAL ENVELOPES

HC headquarters will be analyzed before renovation of the external envelope (the current situation) fig (6) and that analysis in terms of functional ideas (Physical and Non-Physical), Formational, structural and technological ideas, and then clarify how the functions, structures, formation and technology of the building affect its external envelope as follows:

- THE FUNCTIONAL FIELD
  a) Double low-E Glazing
  Due to Cairo's climate, which is very hot in summer and moderately cold in winter, low-e glass is very important in summer, as it diffuses heat absorbed from the building, reducing heat transfer through windows. It also reduces heat transfer from the hotter (outer) part of the glass to the cooler (inner) part, thus reducing the amount of heat passing through the window. Low-e glass prevents large amounts of energy from entering the building, thus cooling the inner spaces fig (8).

Figure 6 HC Securities & Investment SAE, Egypt

Figure 7 Low-e glass transmits light and blocks infrared radiation (heat).

Figure 8 Triple glass with two layers of low-e coating (right), Double glazing with a single layer of low-e coating (left). source: (Rissman et al, 2013)
An explanation of how to assess the level of impact and development of the building as a whole (before renovation: the current situation)

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The building has achieved the lower level of impact in the external envelope.

Table 1: External Envelope Ideas Evaluation list of HC headquarters before renovation process, source: the researcher.

Figure 9: HC building considered a model for the smart village buildings.

Figure 10: HC building Floor Plans before external envelope renovation.
B. The ANALYSIS OF THE BUILDING AFTER RENOVATION OF THE EXTERNAL ENVELOPES

HC headquarters will be analyzed after renovation of the external envelope (The process of improving and developing the envelope) and that analysis in terms of functional ideas (Physical and Non-Physical), Formational, structural and technological ideas, and then clarify how the functions, structures, formation and technology of the building affect its external envelope as follows:

- **THE FUNCTIONAL FIELD**
  a) The Idea of ETFE (Nitrogen filled EFTE cushions) in the Northeast facade
  The main climate issue is increased solar radiation and building temperature, which requires energy-intensive cooling systems. This system works in a climate where the main problem is solar radiation in the summer and doesn’t go through very cold winters like Egypt’s. Due to the intensity of the solar radiation and the disturbing daytime glare in the local environment, ETFE pillows were used. It is a system that works best in buildings designed for office or public use fig (11).
  ETFE is composed of Teflon, a crystalline polymer (Teflon-based polymer). It is a very light material, with high elasticity and anti-sticking, which prevents it from getting dirty and requires maintenance for cleaning, at the same time it does not lose its properties of elasticity, transparency or strength over time and has no tires, very resistant (1500 kg) and ideal for escaping from fires fig (12).

- **THE FORMATIONAL FIELD**
  b) Forming the Envelope as a Digital Pedrera.

Figure 11 Northeast Facade ETFE Nitrogen Filled Pillows (right), Illustrations of ETFE Pillows on the Northeast Facade (left). source: (Balascakova et al, 2016).

Figure 12 HC Floor Plans after external envelope renovation, ground and first floor plan (right), second and third floor plan (left). source: the researcher
The proposed second envelope to renovate the external facades allowed the building to reveal the performative character of architecture by dealing with the multiple disciplines of art, architecture, advanced technological materials and digital processes. The envelope plays a major role in expressing the personality of the building, in addition to its main function, which is solar shading and thermal insulation. The innovative corrugated configuration of the proposed envelope of the building is similar to that of Casa Milà (la pedrera) fig (13), the envelope provides an element of innovation in color and presents a triangular pattern of whole and empty, concave and convex shapes, resembling molecular structures or reptile skin. The ETFE will be a great mural, depending on the thermal needs of the building. A steel frame was added to install the ETFE cushions as a second external envelope fig (14), simulating the Casa Mila, which provided open spaces and flexibility in the internal divisions by transferring all the loads to the piles; With the aim of absorbing light through squares, courtyards and different facades, a goal that Gaudí was able to achieve by opening great gashes in the facade fig (15). The properties of the material represented a distinctive element that imparts an organic composition to the building, as well as a protective and insulating element for the internal spaces, as it resulted from the desire to give the maximum movement in the external envelope. The irregular mosaic pattern of the concave and convex areas organizes itself behind the protective envelope, absorbing sunlight to save energy, blocking ultraviolet rays (UV light) and self-cleaning of non-stick surfaces. Which adds to the building sustainability and innovative impact at the same time. One of the advantages of the ETFE wall is that it has a balanced and clear performance with clear technical control features. For these reasons and the daring nature of the project, it is reasonable to classify the HC building as a digital pedrera fig (16).

- **THE STRUCTURAL FIELD**
  - Steel Truss Frame idea for secondary Envelope support.

The renovation of the building’s external envelope has led to the building showing innovation in construction, performance, maintenance and structural system, and in its uniqueness and diversity of its usable spaces, which is in fact a statement of everything the architect-designer wants to express fig (17). A steel frame has been designed and installed on the main facade of the building, so that ETFE cushions are installed on it. These cushions will represent a second facade that protects against direct sunlight and annoying daytime glare and contributes for providing thermal comfort to the interior spaces, as it provides spaces that can be used as terraces or added to the main space and used as a space for administrative offices fig (18). The idea of
Digitalization in this building has been defined as the result of working as part of a network, not in a chain or parallel to it, and as a fabric through which it’s formed, which in turn reconfigures it through an iterative analysis process until its functions are improved for strength (functionality for strength).

The envelope constructed of a basic steel frame, consisting of a rigid braced frame. The frame type consists of Fink steel beams made of forged-metal girders of seven sections. The frame has a support beam that transfers its load to the rigid support posts. The most effective way to solve the external envelope corrugated design problem is exchanging mass for geometry. In this way, the secondary structure was not resolved by the presence of a dense outer shell that would later become armor; Rather, it was resolved by allowing it to expand into the void.

- **THE TECHNOLOGICAL FIELD**
  - d) The Idea of using ETFE material to represent the Digitalization in Buildings.

In the age of information, architecture should be a technology platform, where bits, connectivity, new materials and nanotechnology are more important than old materials. We live in a non-physical electronic world, where the design of the network, not its actual size, is what matters **fig (20)**. The HC Building will follow digital architecture. Its facades do not represent industrial construction, instead they develop and represent digital construction, the construction of information **fig (19)**. The main idea (the theme) in improving and developing the HC building is how engineering creates a new balance with the digital use of energy, because we are in the field of innovation and ICT, where energy management is the most important goal. This was done using ETFE material in the design of the building's second envelope **fig (21)**. Or in other words, the building needed a way to realize the idea of digital construction, and it was able to do so by using ETFE. By using ETFE (ethylene tetra fluoroethylene) cladding, the building will be able of saving energy. In this case, ETFE provides the advantage of solar filtration. It is also a highly resistant material that is ideal for escaping from fires, and its flexibility can be exploited to create distinctive geometric shapes. Moreover, it is non-stick, which prevents it from getting dirty and requiring maintenance for cleaning. At the same time, it does not lose its properties of elasticity, transparency or strength over time.

The use of ETFE material in the building contributed to giving the maximum possible movement in the external envelope through the properties of ETFE. It enabled the designer to form the facade in a distinctive organic form, and for this reason the building was classified as a digital building and a digital pederera. The building's ETFE cladding is inflatable, with up to three air chambers. This not only improves thermal insulation, but also makes it possible to create shadows via the pneumatic system. The first layer is transparent, the second (middle) and...
the third are designed to have a reverse pattern design, when the second and third layers are joined together a single opaque layer is formed and thus the shadows are formed, and the inflatable section contains only one air chamber. In this way the entire facade can be managed simply by the movement of the air. This is not done with industrial mechanisms, but with air management, which has very positive and energy-efficient results. The northeastern facade receives high solar radiation and requires an external solar system with double-layer cladding to be regulated, which reduces energy consumption and increases illumination efficiency. The solution is to use an external film of materials with a solar filter composed of ETFE in the envelope. Three layers of ETFE were used, with constant pressure and variable air circulation between the rooms.

<table>
<thead>
<tr>
<th>An explanation of how to assess the level of impact and development of the building as a whole (After renovation: The process of improving and developing the envelope)</th>
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<td><strong>Glare Protection</strong></td>
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<td><strong>Heating and Cooling</strong></td>
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<td><strong>Identity</strong></td>
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<td><strong>Facility management technology development</strong></td>
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<td><strong>Facial Ideas</strong>: (The idea of using ETFE material to represent the Digitalization in Buildings)</td>
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<td><strong>Technological Ideas</strong>: (The Idea of using ETFE material to represent the Digitalization in Buildings)</td>
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<td><strong>Glare Protection</strong></td>
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<td><strong>Facility management technology development</strong></td>
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<td><strong>Evolution of computer design</strong></td>
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<tr>
<td><strong>The idea has achieved many values in four architectural field (function, form, structure and technology)</strong></td>
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<td><strong>Integration and compatibility of the form with the environment</strong></td>
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The building has achieved the highest level of impact, renovation and development in the external envelope.
This study highlights the role of the environmental formation of the external envelope, which contributes in providing several environmental benefits to the internal environment in buildings that lead to reducing the risks of sick buildings syndrome and the health effects associated with it. The outer envelope must be an element for linking and compatibility between the internal environment (interior architectural spaces) and the external environment in order to provide comfortable and healthy environment. Far away, without separating the building from the surrounding environment. The various elements of the external envelope (walls, ceilings, floors and environmental installations) must work and perform in a harmonious and balanced way with each other, as they overlap and intertwine in their physical and nonphysical, directly and indirectly. Elements can perform visual, symbolic and practical functions as well. The main financial benefits of achieving this principle are due to the reduced absenteeism rate as a result of providing a comfortable work environment, which results in increased productivity and efficiency. Designing the external envelope using strategies similar to the functions of human body organs led to the building being a strong-willed system, always striving for balance and integration with all external influences.

IV. CONCLUSION

This study highlights the role of the environmental formation of the external envelope, which contributes in providing several environmental benefits to the internal environment in buildings that lead to reducing the risks of sick buildings syndrome and the health effects associated with it. The outer envelope must be an element for linking and compatibility between the internal environment (interior architectural spaces) and the external environment in order to provide comfortable and healthy environment. Far away, without separating the building from the surrounding environment. The various elements of the external envelope (walls, ceilings, floors and environmental installations) must work and perform in a harmonious and balanced way with each other, as they overlap and intertwine in their physical and nonphysical, directly and indirectly. Elements can perform visual, symbolic and practical functions as well. The main financial benefits of achieving this principle are due to the reduced absenteeism rate as a result of providing a comfortable work environment, which results in increased productivity and efficiency. Designing the external envelope using strategies similar to the functions of the human body organs led to the building being a strong-willed system, always striving for balance and integration with all external influences.

1. STANDARDS USED IN EVALUATING BUILDING ENVELOPS

- The envelope must achieve a set of architectural values (functional -formational- structural - technological), and those values must overlap and intertwine in their performance.
- The more the external envelope achieves a number of architectural values, the more successful its envelope formation will be.
- Whenever one of the ideas of the external envelope of a field achieves a number of different architectural values, the idea is characterized by success and effectiveness, and the more it proves the importance of its use in the external envelope (for example, a technological idea has achieved functional, formative, structural and technological values in the envelope).
- The more the external envelope expresses its environment and identity, the more it can be described as the environmentally-formed envelope, so the envelope must express its identity and unique personality with the cultural roots of its environment and surroundings (through the use of environmental materials to highlight the identity during the design of the envelope).
- The building with an environmentally formed envelope must respect its environment, express its original identity, and mimic nature in its functions as much as possible.

ACKNOWLEDGMENT

Thanks to my mother who encouraged me and taught me how to work as hard as possible, for which she has all the credit. thanks to my mother Dr/ Hayam Negm who died as a strong warrior, who had a strong will for living until losing her bitter battle against cancer, this is for you mom.
REFERENCES


AUTHORS

First Author – Essam El-din Badran Abou Al-Einen, Professor at Department of architecture, at Department of architecture, design, and urban planning, Suez Canal University, Ismailia, Egypt.

Second Author – Faysal Mahmoud Abou El-Azm, Associate Professor at Department of architecture, at Department of architecture, design, and urban planning, Suez Canal University, Ismailia, Egypt.

Third Author – Hadeer Abd Al Ellah Ibrahim Mohamed, Senior Architect at IEC International Engineering Consultancy Co.

Correspondence Author – Hadeer Abd Al Ellah Ibrahim Mohamed, hadeerabdalellah@yahoo.com, 01212370185.
Internal Control System and Financial Performance in Banking Industry: A case of Guaranty Trust Bank-Rwanda

1 Patrick Iradukunda & 2 Dr Mercyline Kamande

1 School of Business and Economics, Mount Kenya University, Kigali, Rwanda
2 School of Business and Economics, Mount Kenya University, Kigali, Rwanda

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Abstract- The study examined the contribution of internal control system on financial performance in banking sector taking a case of Guaranty Trust Bank Ltd. The specific objectives were to determine the effect of control environment, control activities, and risk assessment. Results would be useful in terms of not only knowing the impact of internal control system to. This study would be made accessible in library of Mount Kenya University. For methods, a descriptive research design was adopted where both qualitative and quantitative approaches were used. A sample size of 167 respondents selected among 287 employees. The simple random sampling and purposive sampling techniques were used to select respondents and key informants. Primary data was gathered using questionnaire. The study used descriptive statistics to determine frequency, percentage, mean and standard deviation while inferential statistics were used to establish correlation and regression statistics for effect size and level of significance between variables. Content analysis was used for qualitative data analysis. Results on correlation between control environment and performance show a negative significant correlation between ethical values and return on equity since the r= 0.197* and p-value= 0.012. Results from correlation analysis demonstrated that there is significant correlation between competency of personnel and return on equity (r=0.160*, p-value = 0.041). Results from correlation analysis between control activities and financial performance show that rigorous policies were positively correlated with return on equity (r=0.325**, p-value=0.002). Physical control is positively correlated with return on equity (r=0.374**, p-value = 0.037), and physical control is correlated return on asset (0.274**, p-value =0.045). The study concludes that GTB has effective internal control system and financial performance because internal control have significance important on the financial performance of the studied Bank. The study recommends that control environment, control activities, and risk assessment should be enhanced to further improve the financial performance of the Bank. Management should focus on separation of duties, supervision, approval transaction, budget review, communication channel, and management of high risk and should take measure to mitigate risks. Once a strong internal control is established will enhance operational efficiency and effectiveness and improve the financial performance of the Bank.

Index Terms- Internal Control System, Commercial Banks, Risk Assessment, Control Activities, Financial Performance.

I. INTRODUCTION

Despite guidelines of central bank of Rwanda governing banks, there has been many cases of bank failure in performance owing to lack of proper internal control systems (National Bank of Rwanda [BNR], 2020). This is well evidenced in the financial report (2020) which revealed inadequate liquidity, misuse of resources, frauds, errors and irregularities. For example between 2008 and 2009, nine microfinance institutions were put under receivership and closed owing to what the central bank termed as inadequate banking practices (Niyonsenga & Abuya, 2017). Another case, the Bank d’Or du Rwanda (Bancor) was sold to Access Bank while the Fina Bank was sold to GT Bank to owing to what the regulator termed as unsafe financial conditions, inadequate liquidity, delayed compliance to timely reporting, making losses, lack of suitable accountability, fraud and misuse of assets, thus leaving the questions of gaps that exists within banking internal control systems (Mugisha et al., 2015).

Takahiro and Jia (2012) studied the impact of internal control systems on the financial performance of private hospitals in Kenya. This study however, did not take into account the commercial banks. Nyakundi et al. (2014)
assessed the effect of internal control activities on liquidity incorporating risk assessment. This study did not review in details all the internal control system aspects. Ejoh and Ejoh (2014) assessed the correlation between internal control activities and financial performance of universities in Nigeria. This study failed to show the direct impact of internal control systems on financial performance. Ayagre et al. (2014) investigated the adequacy of internal control on Ghanaian banks and only focused on environment and monitoring. Locally, Niyonsenga and Abuya (2017) studied on internal control and bank success in Rwanda with reference to I&M Bank by interrogating upon the role of internal control system on risk management, while Uwingabiye (2019) assessed internal control system component and financial performance in public institutions in Rwanda and focused on monitoring, control environment, information and communication.

According to BNR report (2016), poor internal control systems affect performance of banking institutions and, FINA Bank Plc has not been exception. Poor internal control systems have led to the reduction of its market share from 7.6% to 4.78% in 2015. This has leads to the reduction of its bank operations, leaving FINA Bank to be finally rebranded to Guaranty Trust Bank (GT Bank) after the Nigerian-based bank completed a 70 per cent share acquisition of the Kenyan bank early 2014(New Times, 2014).

The takeover deal, worth about $100m (Rwf67.5b) will see both clients and workers of the bank benefit both in terms of products and service delivery, officials from the bank said. The above BNR report concurs with financial statements of Guarantee Trust Bank between 2012 and 2015, which revealed that the bank has been making losses (GT Bank, 2016).

Majority of the reviewed studies show that internal control systems have a link with and affect financial performance of commercial banks, using descriptive design methodology to bring out the relationship between the variables. This methodology cannot be used to determine the relationship between variables. Appropriate methodology could be correlation design which gives the magnitude and direction of the relationship among the research variables. The present study incorporated three components of internal control systems for this study. Other scholars used correlation design but in different sectors apart from banking sector. Most of researches on the same area have been looked at from the broad perspective i.e. commercial banks' financial performance. The present study narrowed the study to GT Bank in the study of Kigali. The researcher adopted correlation and causal designs as the research methodology to bring out clearly the relationship, and effect between variables. Further, this study sought to fill this gap by examining the contribution of internal control systems on financial performance of commercial banks in Rwanda using Guaranty Trust Bank as a case.

1.1 Research Objectives
i. To determine how Guaranty Trust Bank Ltd-Rwanda has ensured proper control environment for effective operations to improve its financial performance.
ii. To assess how Guaranty Trust Bank Ltd-Rwanda has established enhanced control activities to improve its financial performance
iii. To analyze how Guaranty Trust Bank Ltd-Rwanda undertakes risk assessment for effective operation to improve its financial performance.

II. LITERATURE REVIEW
2.1 Review of Empirical Studies
Basically the internal control system improves and it is involved the introduction and enhancement of introduction environment, accounting system and control project. The law governing banking activities have to respect even in complicated conditions. Internal control system breaks down findings, effective internal control mitigates illegal behaviours (Olumbe, 2012).

The small scale of internal control the business increased personnel want to be aware of objectives and buildings up the term more on bank rules and regulations. Adequate internal control is defined as the problem identification and this lead to the adequacy of banking operations and increased the quality of information of data management, directors and beneficiaries or customers (Pekuri, et al., 2011). Therefore, the bank low financial performance happened due to the fact that they did not construct a control element to link with the banking mission of their founding members.

According to Arwinge (2013), controls are designed and adopted so that legitimacy is achieved and the survival prospects are met. This theory agrees with the corporate governance and the provisions of Sarbanes-Oxley. The Act
of 2002 related to Sarbanes-Oxley which resulted from Enron scandal demands that companies need to give report concerning effectiveness of their internal controls during reporting of their performance and position as part of the general attempt to manage fraud and restore integrity in the process of financial reporting.

Likewise, Mawanda’s focused on two components that’s, control environment and control activities. The two studies did not incorporate the five components of internal control systems so as to make their studies look complete. Nyaga’s research was done in Uganda while Mawanda’s was done in Kenya. Olumbe (2012), sought to establish whether internal control and corporate governance related in commercial banks in Kenya. The variables included; equity structure, enterprise, internal supervision and external supervision vacancy, the board of directors and board of supervisors.

The study adopted a descriptive research design as the research methodology. The researcher gathered primary data with the help of questionnaires, structured and an interview guide which was unstructured. Data analysis was done by the scholar using linear regression model. The scholar found out that internal control was related to corporate governance. The researcher’s study focused only on two components of internal control systems and their relationship with each other but did not touch on the relationship that each component had with financial performance of banks. Both Olumbe and Mawanda did their study in the same country, Kenya.

In the study done by Magara (2013), the findings revealed that independent variables positively and strongly correlated with the dependent variable. The researcher sought to establish whether internal controls had an effect on Kenyan SACCOs’ financial performance.

The scholar took independent variables as control environment, risk assessment, control activities and monitoring. The scholar collected both primary and secondary data for data analysis. Secondary data was obtained by the scholar from the annual reports that were provided by the SACCOs. The scholar used multiple regression models to analyze data and thereafter concluded that independent variables had a positive contribution to SACCOs’ financial performance in Kenya. Both Magara and Olumbe analyzed their data using multiple linear regression models. Magara incorporated the four components of internal control systems leaving out one of the components that’s, information and communication. Magara looked on internal controls in relation to financial performance of SACCOs but Olumbe focused on internal controls in relation to corporate governance in commercial banks, Kenya. None of the two studies focused on financial performance of branches of commercial banks.

A study by Channar, et al.(2015) on internal control effectiveness and its correlation with financial performance in Pakistan indicated that internal control system effectiveness is strongest in private banks and weakest in Islamic banks, although the difference is not statistically large, but slight variation exists. Furthermore, private banks were more likely to perform better than public banks. A study by Barra (2010), was done to determine if internal controls and the penalties had an effect on employees’ attempts to act fraudulently. The researcher used analytical method and focused on control activities and monitoring. Collection of data was done by the scholar from managerial and non-managerial employees. The scholar’s findings revealed that availability of control activities including separation of duties led to high cost of engaging in fraudulent behaviors on the part of employees.

Ejoh and Ejom (2014), carried out a research to check if internal control activities had impact on Nigerian tertiary institutions’ financial Performance. The scholars measured the performance using indicators including accountability, liquidity and reporting. The primary data and secondary data sources were used by the scholars to collect data which was used in the study. Primary data was collected by the scholars through structured questionnaires and interviews. Secondary data on the other hand was collected by the scholars from College publications, text books and journals. Presentation of data was achieved by the scholars with the help of tables and percentages. Furthermore, findings revealed that financial information which was valuable could be accessed by an individual staff without the permission given by the other staff. Generally, their findings as per the study indicated that Nigerian tertiary institutions’ financial Performance was not significantly related to internal controls.

Wu and Rezende (2014), studied on supervision and its effect on performance of banks. They used Return on Equity and Net Interest Margin to indicate performance of bank in their study. Their results suggested that frequent examination of banks encouraged reduction of risk by way of safer assets being held, and that reduced the loss on loan provisions and that it boosted profitability whose measurement was Return on Equity. On the contrary, their results showed that the frequent examinations did not affect net interest margins. Wu and Rezende, like some of the scholars in the studies reviewed focused on one component of internal controls. To make it far much insignificant to justify the conclusion that internal controls systems affect or do not affect financial performance of banks, Wu and Rezende focused on a single sub-component of control activities whose conclusion was based.
A study was conducted by Adagye (2015), on internal control system and its effectiveness in the Nasarawa State tertiary educational institutions for efficiency, where the scholar took a case of Nasarawa State Polytechnic, Lafia. The study methodology adopted by the scholar was a survey design and a simple closed ended questionnaire was used to collect data. The scholar used judgmental sampling procedure. Data analysis was achieved by the scholar through the use of a CHI-square. The researcher presented data in form of tables and simple percentages. The scholar’s study showed that the assets of the institution were physically secured, segregation of duties was fair, transactions were correctly calculated and responsible officer authorized the business transactions appropriately. Similarly, Ejoh and Ejom (2014), Kariuki (2017), Kimotho (2015), Mensah (2014) and Mwangi (2012) studies focused on a single component of internal control system which could not be sufficient to justify the conclusion whether internal control systems affect financial performance or not. Ngari (2017) and Oyoo (2014) studies were similar as both focused on micro-financial institutions with an exception that Ngari did the study across the whole country Kenya while Oyoo narrowed the study to Kisumu County, Kenya. Like Mwangi (2014), Oyoo (2014) and Kimotho (2015) studies, Ngari’s study adopted descriptive research design methodology. Ngari’s study findings were similar to the findings by the various scholarly work reviewed with an exception of Ejoh and Ejom (2014) findings which revealed otherwise in the tertiary institutions of learning.

Ejoh and Ejom (2014) undertook a research on internal control system and financial performance in Nigeria, where findings revealed a dimension of internal control system and financial performance in Nigeria were found to be positively related to performance measured in terms of liquidity, accountability and reporting. Nyakundi et al. (2014) analysed the internal control system and financial performance in Kenya. The research reveals existence of a positive correlation between internal control system and the growth rate for earning. Furthermore, the study evidenced the level of skills, the degree of awareness of the staff within internal control system is also correlated with the probability and the level of awareness in internal control system to the increased income(r=0.988).

A study carried out by Ayagre et al. (2014) on the elements of internal control system and its effect on financial performance of commercial banks, indicate that, tough controls system was established where control environment and monitoring activities are felt to be the main elements control system of banks in Ghana and these two elements have been extremely evidenced by the respondent’s with the mean of 4.72 and 4.66 respectively. Uwaoma (2015) explored the role of internal control system on financial performance using a case of production in Nigeria. Results demonstrated a positive correlation between internal control system and effective utilization of organization funds with a positive correlation with 0.9345. Furthermore, for R squared of 0.87330 demonstrated that 87.33% of the total adjustment in financial management are disseminated to appropriate money in the bank.

A study by Kimotho (2015), revealed that credit risk management procedures influenced profitability of the bank positively. The researcher conducted a research to establish whether credit risk management practices had the effect on Kenyan commercial banks’ financial performance. The scholar adopted a descriptive research design and collected the primary data using a semi-structured questionnaire. The data was analyzed by the same scholar with the help of Statistical Package for Social Sciences (SPSS) version 20. Kimotho’s research design was similar to the study design by Mwangi (2014). Both adopted descriptive research design.

Kimotho also, like Olumbe and Mwangi focused on one component of internal control system, the risk management which was insufficient to justify the conclusion that systems of internal control have an effect on commercial banks’ financial performance. Babatunde (2013) assessed the internal control system on financial control system on financial management and impact of the performance of District. A positive correlation was found to exist between internal control system and organizational performance through direction of relationship between internal and organizational performance. Niyonsenga and Abuya (2017) investigated the internal control system and financial performance in financial institution. Results evidenced that internal control had a significant correlation between internal control and financial performance of I&M bank Ltd.

2.2. Theoretical Framework

The study was guide Agency Theory which presents in the course of firm’s existence, it is therefore availed necessary to set a control that reduce opportunistic actions of agents. It also takes into consideration the asymmetric of information between the principal and the agent when implementing their duties and this is described as adverse selection and moral hazard (Hayali, et al, 2012).This therefore call for establishment of control system to ensure that agents perform their tasks better. This model is positively related to this research as internal control is established with Guarantee Trust Bank Ltd-Rwanda to ensure that each employee implement its assigned duties to enhance
productivity, effective and efficient use of assets to achieve the banks goals and objectives as well as developing a state of accountability among its employees.

Stewardship model emanated from psychology and sociology as evidenced by Doyle and McVary (Fatihudin & Mochklas, 2018) as a steward defends and optimizes shareholders’ wealth via organization success, owing to the stewards’ pertinent role is optimized. Not like agency theory, this theory focuses bot on the position of individualism (Hayali, et al, 2012) but rather on the importance of top managers being as stewards, incorporating their objectives as part of the bank. The theory proposes that stewards are contented and interested when an institutional success is achieved. Fatihudin and Mochklas (2018) denote that while agency theory considers workers or persons as an economic that overturns a personal’s own intentions, on the other hand (Hayali, et al, 2012) evidenced that the this theory acknowledges the role of agencies that enable the steward and provides optimum independence constructed on it.

**Attribution Theory**

The attribution mode emanates from social psychology in order to assess how persons analyze grammar events and attitude and the manner in which they specify roots to the effects and attitude. Suggestions of Simiyu (2011) has employed this model in assessing evidences in social environment to describe events and attitudes. The attribution theory therefore, advances that auditors have to reveal fraud for internal control efficiency and effectiveness to the success of any organization. Auditors are deemed to obtain a good awareness of the internal control in place, determine the plan and execution of internal control systems and examine the functioning efficiency of internal controls. The attribution model proposes that when fraud appears, revealed parties must be responsible and auditors being the regulators are also responsible when supervisors assess substandard audit services are given (Michino, 2011). The attribution theory was relevant to the present study because it seeks auditors to be prominent in revealing fraud risk when it appears. The above theories enabled the researcher to establish the conceptual framework as follows:

**2.3 Conceptual Framework**

The conceptual framework is presented in Figure 1 academic research since it enables researchers to make clear research questions and objectives.
Figure 1 represents the direct link between independent variables: control environment, control activities, and risk assessment with the financial performance of commercial banks which is an independent variable which is return on equity and return on asset as variables. Control environment referred to as the starting point of remaining other parts of internal control. Control environment was conceptualized by integrity values, ethical values, and commitment of personnel and competency of personnel.

Control activities that are policies, guidelines, procedures techniques and mechanisms that ensure the bank to overcome risks. It is study the control activities were conceptualized by procedures, performance reviews, information processing, physical controls and segregation of duties. Risk assessment implies systematic procedure that intends to detect potential risks that could impede the realization of organization goals and their effects before they happen, establishing measures clarifying manner by which problems need to be solved within an entity. This was conceptualized by risk identification, risk analysis and risk management. The dependent variable for the present study was financial performance of commercial banks that was conceptualized using return on asset (ROA) and return on equity (ROE).
equity (ROE) at GT Bank. The intervening variable is expressed in terms of the existence of BNR policy, regulations and GT Bank manual procedures.

III. RESEARCH METHODOLOGY

The study used a descriptive design with a correlation regression size effect. Descriptive statistics find out and assess causes and effects relationship variables with mean and standard deviation and correlational design. The study used descriptive which facilitated the researcher to gather in depth evidence about the population being studied. The descriptive also gave adequate propositions and suggestions to the board of directors of Guaranty Trust Bank Ltd-Rwanda for appropriate financial performance. In this study, the target population comprises of 287 Guaranty Trust Bank Ltd-Rwanda employees from its 14 branches in the country. The descriptive statistics were used by presenting responses in terms of frequencies, percentages, figures and tables with mean and standard deviation. A correlation was used for Pearson Product Moment Correlation to show the link between variables. This consideration of error term is essential to represent other factors not mentioned in the model that normally in one way or another influence banks financial performance.

IV. RESULTS AND DISCUSSION

4.1 Effect of Control Environment on Financial Performance of GT Bank Plc

Table 1 presents the views on effect of Effect of Control Environment on Financial Performance of GT Bank Plc
Table 1: Correlation Analysis on Control Environment and Financial Performance of GT Bank Plc

<table>
<thead>
<tr>
<th></th>
<th>Integrity values</th>
<th>Ethical values</th>
<th>Commitment of Personnel</th>
<th>Competency of Personnel</th>
<th>Increased return on Equity</th>
<th>Increased return on asset</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integrity values</strong></td>
<td>Pearson Correlation</td>
<td>1</td>
<td>.129</td>
<td>.104</td>
<td>.084</td>
<td>.027</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.100</td>
<td>.186</td>
<td>.284</td>
<td>.035*</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td><strong>Ethical values</strong></td>
<td>Pearson Correlation</td>
<td>.129</td>
<td>1</td>
<td>.150</td>
<td>.444</td>
<td>.197</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.100</td>
<td>.054</td>
<td>.000</td>
<td>.012*</td>
<td>.044*</td>
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<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td><strong>Commitment of personnel</strong></td>
<td>Pearson Correlation</td>
<td>.104</td>
<td>.150</td>
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<td>.111</td>
<td>.007</td>
</tr>
<tr>
<td></td>
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<td>.186</td>
<td>.054</td>
<td>.158</td>
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<tr>
<td><strong>Competency of personnel</strong></td>
<td>Pearson Correlation</td>
<td>.084</td>
<td>.444</td>
<td>.111</td>
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<td>.160</td>
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<tr>
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<td>.000</td>
<td>.158</td>
<td>.041*</td>
<td>.064*</td>
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<tr>
<td><strong>Increased Return on Equity</strong></td>
<td>Pearson Correlation</td>
<td>.027</td>
<td>.197</td>
<td>.007</td>
<td>.160</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.035*</td>
<td>.012*</td>
<td>.095*</td>
<td>.041*</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td><strong>Increased return on asset</strong></td>
<td>Pearson Correlation</td>
<td>.094</td>
<td>.064</td>
<td>.090</td>
<td>.035</td>
<td>.419</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.030*</td>
<td>.044*</td>
<td>.025*</td>
<td>.064*</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Results from correlation analysis demonstrated a positive and significant correlation between integrity values and ROE (r=0.027, p-value=0.035), integrity values and ROA (0.094, p-value=0.030). For ethical values, the study found a positive and significant correlation between ethical values and return on equity since the p-value=0.035, p-value=0.064. This correlation is statistically positive since the p value was <0.05 showing that an increase in ethical values affects positively ROE, and vice versa. There is a positive and significant correlation between ethical values and return on assets (r=0.094, p-value=0.044) since the p value is less than 0.05. Results for commitment of personnel, the study found a positive and significant correlation between commitment of personnel and return on equity (r=0.094, p-value=0.035) and return on asset (r=0.094, p-value=0.064). These correlations are statistically positive and significant since all p-values are <0.05 meaning that an increase in commitment of personnel affects positively and significantly ROE, ROA and vice versa. Results from correlation analysis demonstrated that there is a positive and significant correlation between competency of personnel and ROE (r=0.160*, p-value=0.041) and competency of personnel and ROA (0.035, p-value=0.064) since all p values are less than 0.05.
4.2 Effect of Control Activities on Financial Performance of GT Bank Plc

Table 2 depicts views on the Control Activities and Financial Performance of GT Bank Plc.

**Table 2: Correlation between Control Activities on Financial Performance of GT Bank Plc**

<table>
<thead>
<tr>
<th>Rigors policies</th>
<th>Systematic procedures</th>
<th>Performance review</th>
<th>Physical control</th>
<th>Increased Return on Equity</th>
<th>Increased Return on asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.411**</td>
<td>.251**</td>
<td>.290**</td>
<td>.325**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.001</td>
<td>.000</td>
<td>.002</td>
<td>.009</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>Systematic procedures</td>
<td>Pearson Correlation</td>
<td>.411**</td>
<td>1</td>
<td>.125*</td>
<td>.134</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.111</td>
<td>.087</td>
<td>.467</td>
<td>.106</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>Performance reviews</td>
<td>Pearson Correlation</td>
<td>.251**</td>
<td>.125</td>
<td>1</td>
<td>.192*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.001</td>
<td>.111</td>
<td>.014</td>
<td>.022</td>
<td>.066</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>Physical control</td>
<td>Pearson Correlation</td>
<td>.290**</td>
<td>.134</td>
<td>.192*</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.087</td>
<td>.014</td>
<td>.037</td>
<td>.045</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>Increased Return on Equity</td>
<td>Pearson Correlation</td>
<td>.325**</td>
<td>.057</td>
<td>.096</td>
<td>.374**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.002</td>
<td>.467</td>
<td>.022</td>
<td>.037</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
<tr>
<td>Increased Return on asset</td>
<td>Pearson Correlation</td>
<td>.126</td>
<td>.127</td>
<td>.109</td>
<td>.274**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.009</td>
<td>.106</td>
<td>.066</td>
<td>.045</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
<td>164</td>
</tr>
</tbody>
</table>

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

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

A correlation analysis between control activities and financial performance variables was performed in this regards. For the rigor policies, there is a positive and significant correlation with ROE (r=0.325**, p-value=0.002) and ROA of GT Bank (r=0.126*, p-value=0.009) since the p-value less than 0.05. There were insignificant correlations between systematic procedures and ROE (r=0.057, p-value=0.467), with ROA (r=0.127, p-value=0.106). There were significant correlations between performance review and ROE (r=-0.096, p-value=0.022), performance review and ROA (r=0.109, p-value=0.066). Finally, physical control is significantly correlated with ROE (r=0.374**, p-value=0.037) and ROA (0.274**, p-value=0.045). The physical control is significantly correlated with ROA and ROE since the p-value is less than 0.05. This study argued that the respondents also posited that their banks had incorporated strong internal control system and added that significant positive association exists between internal control and corporate governance.
4.3 Effect of Risk Assessment on Financial Performance of GB Bank Plc in Rwanda

Table 3 illustrates the views on the effect of risk assessment on financial performance of GB Bank Plc in Rwanda

<table>
<thead>
<tr>
<th>Risk identification</th>
<th>Risk analysis</th>
<th>Risk management</th>
<th>Increased return on Equity</th>
<th>Increased return on asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1 .026 .161 .060 .039</td>
<td>Sig. (2-tailed)</td>
<td>N 164 164 164 164 164</td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.026 1 .003 .067 .041</td>
<td>Sig. (2-tailed)</td>
<td>N 164 164 164 164 164</td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.161 .003 1 .027 .011</td>
<td>Sig. (2-tailed)</td>
<td>N 164 164 164 164 164</td>
<td></td>
</tr>
</tbody>
</table>

Results show a Positive and significant correlation between risk identification and ROE (r=.060, p-value=0.044). They also show a positive and significant correlation between Risk identification and ROA (r=-0.039**, p-value=0.016) given that all p values were < 0.05 implying that the variation in risk identification significantly produce a variation in ROA and ROE and vice versa. Results show a positive and significant correlations between risk analysis and ROE (r=0.067, p-value=0.092), risk analysis and ROA (r=0.041, p-value=0.098) given that all p values were <0.05 implying that the variation in risk analysis significantly produce a variation in ROA and ROE and vice versa. Results show a positive and significant correlation between risk management and ROE (r=0.027, p-value=0.034), they also show a positive and significant correlation between risk management and ROA (r=0.011, p value =0.090) given that all p values were <0.05 implying that the variation in risk management has significant change in ROA and ROE and vice versa. Results evidenced that there is a positive and significant correlation between risk assessment and financial performance of GT bank, since all three components assessed, show that there is a positive and significant correlation between them and the financial performance of the GT-Bank plc.
V. DISCUSSION OF THE RESEARCH FINDINGS

The first objective was to assess the effect of control environment on financial performance of commercial banks in Rwanda. The present study did not contradict the findings of Abdullahi and Muturi (2016) internal control systems is an organization system that encompasses all internal control processes established to make sure that both effective and efficient operation of an organization are achieved. Furthermore, internal control system concerns all techniques adopted by a firm to attain organization objectives. Results from correlation analysis demonstrated that there is significant correlation between competency of personnel and ROE ($r=0.160^*$, p-value=0.041) since the p value is less than 0.05, again there is significant correlation between competency of personnel and ROA (0.035, p-value=0.064). This study agrees with the findings of Bayyoud and Sayyad (2015) contended that assessment of internal control system stimulated the control environment of the effects of new banking reformation system and regulations on the risk assessment.

The findings from the present study concur with the observation of Channar, et al.(2015) who carried out a research on internal control effectiveness and its correlation with financial performance in Pakistan indicated that internal control system effectiveness is strongest in private banks and weakest in Islamic banks, although the difference is not statistically large, but slight variation exists. Furthermore, private banks were more likely to perform better than public banks. This study concurs of Bayyoud and Sayyad (2015) where they contended that assessment of internal control environment stimulated the identification of the effects of new banking reformation system and regulations on the risk assessment. Results from the above study evidenced that the general internal control and risk management system in Palestine had an importance in the banking qualitative and quantitative performance.

The second objective of the study was to determine the effect of control activities on financial performance of GB Bank in Rwanda. This present study was in line with a survey done by Babatunde (2013) on the role of effective internal control on financial accountability in the Nigerian public sector. The study denoted that distribution of information among entity’s stakeholders plays a significant role to the management of information between managers themselves and subordinates is among the main good indicators of advanced of effective level of management. A correlation analysis between control activities and financial performance variables was performed in this regards. This study did not contradict with Olumbe (2012) by showing that the most of banking financial institutions established different control activities to evaluate the level internal control system and entity performance. The author argued that the respondents also posited that their banks had incorporated strong internal control system and added that significant positive association exists between internal control and corporate governance. The results on coefficients of correlation show that rigors policies are affecting return on equity, it implies that an increase by unit in adopting rigors policies would produce an increase in return on equity by 32.3% at GT Bank. This study is relevant with a research done by Uwaoma (2015) explored the role of internal control activities on financial performance using a case of production in Nigeria. Results demonstrated a positive correlation between internal control system and effective utilization of organization funds with significant correlation of 0.034.

The third specific objective was to establish the effect of risk assessment on financial performance of GT Bank in Rwanda. Information demonstrated responses collected on the most commonly applied internal control risk management at GT Bank in Rwanda. In this regards, GT Bank has introduced adequate practices for the identification of risk affecting its activities as strongly confirmed by mean 4.184, standard deviation 0.941, meaning that have agreed with the statement. Reconsidering the report of Babatunde (2013), the risk assessment, every bank, focusing on scope, encounters a different risk from internal and external environment that would be approved and responded to. This study is relevant with the observation of Niyonsenga and Abuya (2017) investigated the internal control system and financial performance in financial institution. Results evidenced that internal control had a significant correlation between internal control and financial performance of I&M bank Ltd. A regression analysis was done to produce a model summary, analysis of variance and coefficient model for all dependent variables.

From findings, the value of R squared demonstrated that the variation in ROE in GT Bank was resulted from adjust risk assessment for clarifying the proportion of difference in dependent variable financial performance as specified by the independent variables. Ejoh and Ejom (2014) undertook a research about the impact of internal control on financial performance of Universities in Nigeria. However, the present research did not go far enough in explaining how and why risk assessment works, and the conditions that facilitate its effectiveness. This study also did not cover points like causes of persistent weakness in internal control system which is a significant gap that this study tends to bridge.
VI. CONCLUSION AND RECOMMENDATIONS

It is evident from the findings that the dimensions of internal control thus control activities, control environment and risk assessment have a significance effect on the financial performance of GT Bank Plc in Rwanda.

Therefore, to the first research question, the study was to investigate the internal control and financial performance of GT Bank Plc in Rwanda. This objective was achieved through a questionnaire survey. Internal control involves financial control set up by the management in order to ensure achievements of its planned objectives. According to above findings, the following conclusion can be drawn; the internal control environment affects positively the financial performance of banking industry.

To the second research question, the study concluded that GT Bank Plc in Rwanda has effective internal controls and financial performance because the component of internal control thus control activities, control environment, risk assessment have a significance important on the financial performance of GT Bank Plc in Rwanda. It was indicated that control activities were carried out regularly by most GT Bank Plc in Rwanda. This is supported by clear separation of duties, supervision, approval transaction, budget review, communication channel, and how management focus on high risk and how took measure to mitigate risks.

To the third research question, the study concluded that internal control system adopted by GT Bank as studied were control activities, control environment, risk assessment. The correlation analysis felt that the adoption of rigor policies significantly, contribute to the increase of return on equity while physical control is significantly correlated with ROE and ROA.

The results of the study show positive significant correlations between all measurements of risk assessment with ROE and ROA. Finally, positive and significant correlations were found between risk identification, risk identification and ROA given that all p values were <0.05 implying that the variation in risk assessment significantly produce a variation in ROA and ROE and vice versa. Results evidenced that internal control system had significant correlation between internal control and financial performance. In accordance with results and gaps left out by previous researchers in relation the researcher recommends that the components of the ICS (control environment, control activities, and risk assessment) should be enhanced to further improvement of the financial performance of GT Bank Plc in Rwanda. Management should emphasize in clear separation of duties, supervision, approval transaction, budget review, communication channel, and management would focus on high risk and should take measures to mitigate risks.

There is a need for management to fully understanding their obligations and take necessary actions in ensuring financial performance of their commercial banks. Management in the Banking industry must increase awareness of employees in order to change their core beliefs and help to ensure efficient and effective operations to achieve the objectives of GT Bank Plc in Rwanda. Management should work to improve cost and expenses control as for the moment, even if current ratio was better, management need to significantly reduce operating expenses. Management needs to identify the major cost and expenses drivers. Management should identify and assess the utilization of assets to generate money; GT Bank Plc in Rwanda’s debt to equity ratio was increased over the three years. GT Bank Plc in Rwanda’s solvency is still need improvement management should seem to be taking all the right measures to steer the bank towards improved financial outcomes. The study recommends that assessment of risk associated with institutions, objective is carried out regular so that the management can know whether or not the institution objective will be met.

Management should make sure that they involve their staff in the process of assessment for thorough and effective risk identification and prevention internal control is a right significant aspect with regard to safety of financial performance of any organization. To The officers entitled with the authority to incur and approve expenditure need also to be accountable for every resource utilized and the Bank gets value for its investments. To the Employees also have a right to identify risk in their department and they put in place a control mechanism there is need for the employees responsible for preparation of financial statements and reporting to be transparent and honest and also be held accountable for any misreporting. Therefore, one strong internal control established would enhance operational efficiency and effectiveness and improve the financial performance of GT Bank Plc in Rwanda.

REFERENCES


AUTHORS

First Author – Patrick Iradukunda, School of Business and Economics, Mount Kenya University, Kigali, Rwanda

Second Author – Dr Mercyline Kamande, School of Business and Economics, Mount Kenya University, Kigali, Rwanda

Email of the corresponding author: patrickyope@yahoo.com
East African Community Integration and Cross-Border Economic Development of Rwanda: A Case Study of Ministry of Trade and Industry of Rwanda

1* Alphonse Nkubana & 2* Dr. Eugenia Nkechi Irechukwa

1*School of Social Sciences, Mount Kenya University, Kigali, Rwanda
2School of Business and Economics, Mount Kenya University, Kigali, Rwanda

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Abstract- This paper examined effect of East African Community integration process on Economic development of Rwanda. The specific objectives were to analyze the effect of East African free trade, customs union and common market. After assessing appropriate strategies, the government of Rwanda was aware the best practices needed in order to promote community integration and cross-border trade development. The study adopted a descriptive research design. A sample size of 185 respondents and 16 key informants was selected from 365 target population. The study used both primary and secondary data. Primary data was collected using questionnaire where researcher analyzed data by qualitative and quantitative. Data analyzed using descriptive studies aided by Statistical Package for Social Sciences version 22 and findings presented on frequency tables, figures and graphs, inferences drawn from the data obtained. Descriptive and inferential data analysis were used for data analysis. Content analysis was used for qualitative data analysis. The findings from the value of adjusted R squared was 0.665, that there was variation of 66.5% on the free trade, custom union, and common market. This shows that 66.5% changes in cross-border economic development could be accounted for free trade, custom union, common market. The study found that Pearson correlation model revealed that there was a positive relation found between Free trade, Custom union and common market. There was weak correlation between custom union and cross-border economic development (r=.335**p=0.000<0.01), Free trade and cross-border economic development (r=0.360, p=0.000<0.01), weak positive correlation between common market and cross-border economic development (r= 0.163**, p=0.063 > 0.01). A positive correlation between common market and Free trade (r=0.989**, p=0.000<0.01), moderate correlation between common market and custom union (r=.364**, p=0.000<0.01), moderate correlation between common market and custom union (r=0.570**, p=0.000<0.01). The study recommends that cross border trade and immigration officials from the directorate of immigration and emigration as well as civil servants drawn from line ministries should develop coherent domestic economic regulations and on free trade, custom union should prevent the introduction of taxes between members that can possess impact of improving taxes to the high degree during the sign of a treaty establishing custom union.

Index Terms- Common market, Custom Union, Free Trade.

I. INTRODUCTION

There are numerous reasons why a number of people choose to engage in ICBT. The one fact that remains constant is that all they seek is survival; to be able to obtain income to make ends meet and escape poverty. In EAC, despite the fact that there are numerous initiatives on eradicating poverty, none of them have considered looking into ICBT. For a long time ICBT has been relegated to the back seat. For instance, the EAC integration process led to the signing of the Customs Union Protocol in 2005 whose main objective was to remove internal tariffs as well as non-tariff barriers to trade so as to create a large single market and investment area. In that regard it was meant to facilitate cross border trade and promote cross-border trade development in the region.

Nonetheless, the legislation has not taken into account the plight of ICBT considering that only policies that aim at strengthening formal trade among member countries have been realized. Further, the Customs Union Protocol has not even been effectively publicized. As a consequence, many informal cross border traders are not aware of its existence and are therefore oblivious of the benefits that they can derive there from. The neglect of ICBT shows that
legislators have not fully appreciated the benefits that this trade can generate and the fact that they have downplayed it means overlooking a significant proportion of trade. However, since the inception of the Customs Union Protocol in 2005, only policies aimed at strengthening formal trade among member countries have been realized. Cross broader trade has completely been downplayed despite the fact that it constitutes a significant proportion of regional cross border trade. This research therefore discussed the nature and scope of cross broader trade in EAC.

1.1 Research Objectives

i. To assess effect of East African free trade on cross-border economic development in Rwanda.

ii. To determine effect of East African customs union on cross-border Economic development in Rwanda.

iii. To assess the effect of East African common market on cross-border economic development in Rwanda.

II. LITERATURE REVIEW

2.1 Review of Empirical Studies

The essential for all regional integration is the decrease and the removal of all custom duties imposed on trade in goods between members. A study conducted by (Burger, et al., Linders, 2009) on the effects of free trade on a sample size of 234 companies using a mixed method have demonstrated that a complete trade agreements on the removal of restrictions on trade encourage trade creation with member countries while lead to trade diversion with non-member states. Therefore, a strong relationship was revealed by authors. A study conducted by Egger and Michael (2014) on the verification of vinerian theory of trade creation and diversion argue that the Viner was the first researcher who presented his theory on general trade effects dividing the effects into two: trade creation and diversion in the traditional, static welfare analysis. In general, as Viner discovered, both trade creation and diversion are possible consequences of the free trade. Furthermore, Fontagné, et al., (2011) carried out a study on the effects of ECOWAS free trade on Nigerian predicting model has been utilized relying on ORANI-F general equilibrium for USA. The study findings contended that ECOWAS free trade is entirely profitable in improving cross-border trade development in ECOWAS members in short and in long term effects. The influence of ECAWS free trade is more significant than the effects of free trade by solely advanced countries that are member of APEC.

A research carried out by Firdaus (2011) on the effects of COMESA on manufacturing trade adopting dynamic general equilibrium model. The scholar discovered that FTA by COMESA member states including internal trade agreements with WTO, COMESA and ECOWAS may contribute to the cross-border trade development of members in general. Joining FTA lead to the expectation of GDP increase. Therefore, Rwanda could benefit from improved export as results of the accessibility to large market of other EAC member states. Findings from the study of HeYong (2013) on the contribution of COMESA, SADC, ECAWS AND EAC FTAs utilizing gravity model and established that trade within members has been improved. EAC FTA lead to the trade diversion from non-members and SADC FTA stimulate to a trade enhancement with non-members. Hoekman (2014) assessed various potential effects of FTA in trade movements by adopting indicators of intra-FTA interconnectedness to show the role of FTA on trade flows between two countries from the use of gravity model. Scholars revealed that FTAs contribute more to the trade expansion and to the trade reduction is imperfect (Plummer et al, 2010).

Differently, Kanyimbo and Manduna (2013) developed a model that explains the general trade effects of the regional trade agreements in an imperfect competition framework. The main idea in his theory is based on the influence of special interest groups on government decision making, which is essential part in the theory as governments are the ones who decide whether to join RTA. Khordagui and Oehan (2013) uses the distributive and strategic effects to describe the relationship between internal and external tariffs. The positive relationship between internal and external tariffs leads to trade creation within the members and between members and nonmembers.

A study conducted by Plummer et al (2010) on custom union on Asian four tigers using a mixed method with a gravity model analysis, discovered that the FTA led to the promotion of foreign direct investment by establishing higher combined marketplace international companies. These companies argue that FTA produces dynamic economies would start investing in member states that has low cost of productivity and low trading costs and course return on capital increased competitiveness from other region can lead to low production for corporates (Plummer, Cheong and Hamanaka,2010). Preferential liberalization might affect FDI in four ways: (1) effect of investment and other non-trade provisions; (2) effects of modification in trade movement; (3) trade creation of large market but also
(4) long-term growth effects (Rahman, 2009). The economies of scale can appear due to the increased technical efficiency in production ability to allocate managerial cost and overhead from suppliers (Kotabe and Helsen, 2010). A study carried out by Daniel, José, Adolfo and Isaac (2017) in Subsahara African in order to assess the effects of Trade and Custom union on Economic Growth in Africa. An econometric model was used. This measured custom union by means of three indicators, namely trade, export and import related costs, constructed by using principal component analysis. These indicators are used as exogenous variables to estimate an augmented growth model which. The findings suggest that custom union serves as an important channel through which trade affects economic growth. A research undertaken by Perera, et al (2016) on custom union, cross-border trade development and poverty alleviation in South Asia, has been confirmed that free trade aimed at expanding trade, has been insufficient in optimizing the potential contribution of trade to cross-border trade development and reduce poverty. A desk research was conducted to meet this objective and assess the relationship between TF, trade growth and cross-border trade development based on statistics collected from online databases and existing available quantitative estimations, confined to the South Asian region. The most common of these are ‘Doing Business’ (DB) indicators related to trading across borders, the World Bank’s Logistics Performance Index (LPI), the Organization for Economic Co-Operation and Development’s (OECD) TF indicators and the World economic forum’s Enabling Trade Index (ETI) .

A study carried out by Pearson and Chaitzevi (2012) reiterates that a complicated trade procedures and strong regulatory requirements increase documentation processes required for trade transactions. However, insufficient customs and port-handling procedures, poor use of information technology and transit barriers feature as major aspects of TF, causing additional TTCs. Border transaction costs in South Asia can be as much as 50% higher than the developing countries of East Asia and the Pacific. This worsens in landlocked countries, which recorded the greatest time taken for trade transactions due to border transit restrictions.

Renard (2011) explains that the provisions on customs encapsulated in the agreement were planned to improve transparency. The agreements also need members to protect customs processes for exporting are relied on custom-to-business partnership adopted by the World Customs Organization (WCO). A study report of Schumacher (2012) concurs that trade agreements give systematic mutual cooperation on market supervision and enhancing to transparency which can ameliorate the dissemination of information related to technical regulations, standards and conformity evaluation. The aforementioned members give critics by granting protracted due and gratify all parties to post the critics obtained and final regulations on official websites. These measures were advanced and adopted on relying on international standards on audit, is none disseminating in nature, transparency and the reduction of disruptions to trade.

Article 69 of the TRIPS provides for common market against trade in goods infringing intellectual property rights, particularly counterfeit trademark goods and pirated copyright goods (Seetanah, et al, 2013). Common market under customs valuation deals with the truth or accuracy of the good’s declared value and is mainly inscribed in paragraph 8.3 of the Agreement on the Implementation of GATT Article VII and paragraph 12 of the Doha Ministerial Declaration. Article 12 of the Agreement on Custom union (TFA) sets forth comprehensive rules on common market. Snorrason (2012). By examining the relevant WTO legal texts, this article contends that exchange of information is at the core of common market, and that reciprocity, due diligence, good faith, confidentiality are the central principles for exchange of information between customs authorities.

2.2. Theoretical Framework

This study is anchored on classical theory of trade, Viner’s model and free trade theories.

2.2.1 The Classical Theory of Trade

Classical theory of trade advocates that different countries are likely to have certain advantages in some types of production and certain disadvantages in others (Schumacher, 2012). The classical theory of trade is relevant to this study as most of free trade agreement states that which have specialized in commodity seeks to trade with other members on the commodities they do not participate in their productions or do not satisfy the demand of their markets. According to the theories given by them, when a country enters in foreign trade, it benefits from specialization and efficient resource allocation. The foreign trade also helps in bringing new technologies and skills that lead to higher productivity.

2.2.2 Complex interdependence theory
This study is anchored on the complex interdependence theory. Complex interdependence theory in international relations is the idea put forth by Keohane and Nye that states and their fortunes are inextricably tied together (Ur, 2014). From the perspective of international system, the problem is how to generate and maintain a mutually beneficial pattern of cooperation (Van den Bossche & Zdouc (2013). In interdependence there are costly reciprocal effects of transaction among the actors (Nau, 2018). This theory is applicable to the study in that the members of free trade agreements depends on each other for trade with one another. However, the existing barriers to this interdependence in the name of regulatory frameworks imposed by the member countries.

2.2.3 Theory of economic regional integration
Economic integration theory goes through two development stages each of which address the relevant for its time political and economic context (Okumu & Nyankori, 2010). The first stage is regarded as classic theory or static analysis and includes the traditional theories of economic integration that explain the possible benefits of integration. The second stage includes the new economic integration theories that are often referred to as dynamic analysis of economic arrangements. Besides these two, there is a third type of integration theories that deals with the effects, benefits and constrains of economic integration arrangements of developing and least developed countries (Okumu and Nyankori, 2010). The current research project tries to come up with a conclusion on what parts of the classic and new integration theories are applicable to integration arrangement among developing countries and to summarize these theories. Regional integration theory seeks to explain the establishment and development of regional international organizations. This theory was beneficial to the study as it emphasizes the importance of free trade agreements and the cross-border trade development. The theory is relevant in that tariff and non-tariff barriers, trade complication, customs naïve and unprotected foreign direct investment would bring inefficiencies in trade among countries. The above theories enabled the researcher to establish the conceptual framework as follows:

2.3 Conceptual Framework
The conceptual framework is presented in Figure1.

<table>
<thead>
<tr>
<th>Independent Variable</th>
<th>Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EAC Integration Process</strong></td>
<td><strong>Cross-Border trade development</strong></td>
</tr>
<tr>
<td><strong>Free Trade</strong></td>
<td>• Import volume</td>
</tr>
<tr>
<td>• Trade of goods without taxes</td>
<td>• Export Volume</td>
</tr>
<tr>
<td>• Quotas on imports</td>
<td>• Cost Reduction</td>
</tr>
<tr>
<td>• Common external tariff</td>
<td></td>
</tr>
<tr>
<td><strong>Custom Union</strong></td>
<td></td>
</tr>
<tr>
<td>• Simplification of customs processes</td>
<td></td>
</tr>
<tr>
<td>• Common Visa</td>
<td></td>
</tr>
<tr>
<td><strong>Common Market</strong></td>
<td></td>
</tr>
<tr>
<td>• Single payment on duty</td>
<td></td>
</tr>
<tr>
<td>• Removal of additional tariffs</td>
<td></td>
</tr>
<tr>
<td>• Sharing tariff revenue</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1 represents the direct link between independent variables; the research study has three variables. These are dependent, independent and intervening variables. International free trade agreements is an independent variable. This was explored free trade, custom union, and common market. Free Trade was assessed using trade of goods without taxes, quotas on imports, common external tariff, and subsidies for producers. Furthermore, custom union was measured using the following parameters: simplification of customs processes, improve transparency, and common visa. The common market was evaluated by single payment on duty, removal of additional tariffs, and sharing tariff revenue. On the other hand, the dependent variable is cross-border trade development; from economic perspective, the dependent variable was measured using the following indicators: import volume, export volume, and cost reduction. Through the intervening variables which was measured through government policies.

III. RESEARCH METHODOLOGY

The study used a descriptive design with a correlation regression size effect. The study used descriptive which facilitated the researcher to gather in depth evidence about the population being studied. For this study, the researcher used both qualitative and quantitative research methods in order to create concrete results. The mixed methods design strategy was selected for the research. In this study, the target population of this study was 365 entrepreneurs involved in cross-border trader (MINICOM (2018). Approximately, 301 respondents were sampled from entrepreneurs involved in cross border trade and immigration officials from the directorate of immigration and emigration as well as civil servants drawn from the line ministries for instance the Ministry of East African, Ministry of Foreign Affairs and NGOs mandated with management of migration of persons as well as regional integration. The population size is irrelevant and a sample size was 201 adequate. Based on research design, the researcher used documentary analysis, questionnaires and interview schedules and primary data collecting instruments. The descriptive statistics were used by presenting responses in terms of frequencies, percentages, figures and tables with mean and standard deviation. A correlation was used for Pearson Product Moment Correlation to show the link between variables. Linear regression analysis was conducted to investigate the statistical effect of East African Community integration process on cross-border economic development in Rwanda.

IV. RESULTS AND DISCUSSION

4.1 Effect of East African free trade on cross-border economic development in Rwanda

Table 1 presents the views on effect of East African free trade on cross-border economic development in Rwanda

<table>
<thead>
<tr>
<th>Free Trade parameters used in EAC integration</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trade of goods without taxes has been adopted by EAC members states</td>
<td>0.0</td>
<td>0.0</td>
<td>23.2</td>
<td>4.2</td>
<td>72.6</td>
<td>4.38</td>
<td>1.390</td>
</tr>
<tr>
<td>Quotas on imports has been adopted by EAC members states</td>
<td>1.2</td>
<td>0.0</td>
<td>0.0</td>
<td>83.2</td>
<td>15.6</td>
<td>4.77</td>
<td>1.339</td>
</tr>
<tr>
<td>Common external tariff has been applied by EAC members states</td>
<td>3.2</td>
<td>0.0</td>
<td>0.0</td>
<td>35.8</td>
<td>61.2</td>
<td>4.36</td>
<td>1.199</td>
</tr>
<tr>
<td>Subsidies for producers were given to entrepreneurs involved in cross border trading activities</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>37.6</td>
<td>67.4</td>
<td>4.31</td>
<td>1.260</td>
</tr>
</tbody>
</table>

Table 1: Effect of East African free trade on cross-border economic development in Rwanda.
In regards, researcher was interested in knowing effect of East African Community integration process on cross-border economic development in Rwanda ensure Trade of goods without taxes has been adopted by EAC members’ states 72.6 % strongly agreed, 4.2% agreed, 23.2% while 0.2% strongly disagreed with mean of 4.77 with standard deviation 1.339. On Quotas on imports has been adopted by EAC members’ states this 83.2% strongly agreed, 15.6% agreed while 1.2% strongly disagreed with mean of 4.38with standard deviation 1.390. In this research, 61.2% of respondents strongly agreed that Common external tariff has been applied by EAC members’ states while 35.8% agreed and only 3.2% strongly disagreed with mean of 4.31 with standard deviation 1.199. The research findings revealed that Subsidies for producers were given to entrepreneurs involved in cross border trading activities this was confirmed by disagreed 67.4% and also 37.6% agree while 4.2% strongly disagreed with mean of 4.31 with standard deviation 1.260. Therefore, researcher concluded East African free trade plays important role on cross border trade development in Rwanda.

4.2 Effect of Custom Union on cross-border economic development in Rwanda.

The result on effects of custom union on cross border trade development in Rwanda is presented with basis of research objectives. The Likert-type scale was used to rate their responses on a 5– point scale ranging from 5 = Strongly Agree to 1 = Strongly Disagree. 

Table 2: Effects of custom union on cross border trade development in Rwanda

<table>
<thead>
<tr>
<th>Custom Union on Cross-Border Trade Development</th>
<th>Strongly disagree (1)</th>
<th>Disagree (2)</th>
<th>Moderate (3)</th>
<th>Agree (4)</th>
<th>Strongly Agree (5)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simplification of customs processes has facilitated cross border trade</td>
<td>0.2</td>
<td>0.0</td>
<td>23.2</td>
<td>0.0</td>
<td>72.6</td>
<td>4.08</td>
<td>1.158</td>
</tr>
<tr>
<td>Improving transparency in EAC member states was effective in developing cross border development</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>65.3</td>
<td>34.7</td>
<td>4.60</td>
<td>1.230</td>
</tr>
<tr>
<td>Common Visa has been adopted to boost cross border trade development</td>
<td>3.2</td>
<td>0.0</td>
<td>0.0</td>
<td>71.6</td>
<td>28.4</td>
<td>4.89</td>
<td>1.197</td>
</tr>
</tbody>
</table>

On Simplification of customs processes has facilitated cross border trade 72.6% of respondents strongly agreed while 23.2% neither agreed nor disagreed with mean of 4.08 with standard deviation 1.158. On improving transparency in EAC member states was effective in developing cross border development 34.7 % of respondents strongly agreed while 65.3% of respondents agreed with mean of 4.60 with standard deviation 1.230. On statement Common Visa has been adopted to boost cross border trade development 28.4% of respondents 71.6 % strongly agreed of respondents agreed while 3.2% of respondents neither agreed nor disagreed. With mean of 4.89 with standard deviation 1.197. Therefore, researcher concluded custom union plays important role on cross border trade development in Rwanda.

4.3 Effect of common market on Cross-Border Trade Development

The result on effects of trade common market on cross border trade development. The Likert-type scale was used to rate their responses on a 5– point scale ranging from 5 = Strongly Agree to 1 = Strongly Disagree.
Table 3: Effects of trade common market on cross border trade development

<table>
<thead>
<tr>
<th>common market on Development</th>
<th>Cross-Border Trade</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>The single payment on duty has been established in the EAC member states</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>33.7</td>
<td>63.2</td>
<td>4.08</td>
<td>1.158</td>
<td></td>
</tr>
<tr>
<td>Removal of additional tariffs has been adopted in the EAC</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
<td>65.3</td>
<td>34.7</td>
<td>4.79</td>
<td>1.291</td>
<td></td>
</tr>
<tr>
<td>Sharing tariff revenue has been applied in the EAC</td>
<td>0.0</td>
<td>5.3</td>
<td>0.0</td>
<td>57.9</td>
<td>36.8</td>
<td>4.64</td>
<td>1.216</td>
<td></td>
</tr>
</tbody>
</table>

On the single payment on duty has been established in the EAC member states 63.2% of respondents strongly agreed while 33.7 % agreed with mean of 4.08 with standard deviation 1.1158. On Removal of additional tariffs has been adopted in the EAC 34.7 % of respondents strongly agreed while 65.3% of respondents agreed with mean of 4.76 with standard deviation 1.291. On statement Sharing tariff revenue has been applied in the EAC 28.4% of respondents strongly agreed of respondents 57.9 % agreed while 5.3% of respondents disagreed with mean of 4.64 with standard deviation 1.216. Therefore, researcher concluded trade common market plays important role on cross border trade development in Rwanda

4.4 Level of Cross Border Economic Development in Rwanda

The result on EAC integration has improved the level of cross border economic development in EAC. The Likert-type scale was used to rate their responses on a 5– point scale ranging from 5 = Strongly Agree to 1 = Strongly Disagree

Table 4: Respondents view Level of Cross Border Economic Development in Rwanda as an outcome of adopting the EAC integration

<table>
<thead>
<tr>
<th>Level of Cross Border Economic Development in Rwanda as an outcome of adopting the EAC integration</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Moderate</th>
<th>Agree</th>
<th>Strongly Agree</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is an increase number of import volume due to EAC integration hence cross border economic development in EAC</td>
<td>0.0</td>
<td>2.4</td>
<td>4.3</td>
<td>93.3</td>
<td>63.2</td>
<td>4.58</td>
<td>1.1406</td>
</tr>
<tr>
<td>There is an increase number of export Volume due to EAC integration hence cross border economic development in EAC</td>
<td>0.0</td>
<td>3.8</td>
<td>1.6</td>
<td>94.6</td>
<td>34.7</td>
<td>4.38</td>
<td>1.1168</td>
</tr>
<tr>
<td>Cost has been reduced due to EAC integration hence cross border economic development in EAC</td>
<td>0.8</td>
<td>6.4</td>
<td>0.3</td>
<td>92.5</td>
<td>0.0</td>
<td>3.93</td>
<td>1.230</td>
</tr>
</tbody>
</table>

The results reveal that there is an increase number of import volume due to EAC integration hence cross border economic development in EAC 93.3% strongly agreed 63.2 % agreed 2.4 % disagreed while 4.3% of respondents neither agreed nor disagreed with mean of 4.58 with standard deviation 1.1406. On statement that. There
is an increase number of export Volume due to EAC integration hence cross border economic development in EAC 3.8% of respondents neither agreed nor disagreed, 94.6% agree while 1.6% strongly agreed with mean of 4.38 with standard deviation 1.1168. On statement that Cost has been reduced due to EAC integration hence cross border economic development in EAC 6.4 % of respondents disagreed 0.3 % neither agreed nor disagreed, while 92.5% agree with mean of 3.93 with standard deviation 1.230. Therefore, researcher concluded there was increased level of Cross Border Economic Development in Rwanda as an outcome of adopting the EAC integration.

4.5 Inferential Statistic

This study assesses the evaluate the effect of East African Community integration process on cross-border economic development in Rwanda. In a more summarized way, reports OLS results for study as follows:

Correlation analysis

Pearson Correlation was applied to establish the relationship between East African Community integration process (Free trade, Custom union, Common market) and cross-border economic development in Rwanda.

Table 5: Correlation analysis

<table>
<thead>
<tr>
<th>cross-border economic development in Rwanda</th>
<th>Custom union</th>
<th>Common market</th>
<th>Free trade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation 1</td>
<td>.335**</td>
<td>.364**</td>
<td>360**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Custom union</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.570</td>
<td>.000</td>
</tr>
<tr>
<td>Common market</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.063</td>
<td></td>
<td>.000</td>
</tr>
<tr>
<td>Free trade</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
</tbody>
</table>

The study aimed at establishing the relationship between independent variable (East African Community integration process) and dependent variable (cross-border economic development in Rwanda), the Pearson correlation model revealed that there was a positive strong correlation was found between Free trade, Custom union and common market. There was weak correlation between Custom union and cross-border economic development in Rwanda ($r=.335*, p=0.000<0.01$), Free trade and cross-border economic development in Rwanda ($r=0.360, p=0.000<0.01$), weak positive correlation between Common market and cross-border economic development in Rwanda ($r= 0.163**, p=0.063 > 0.01$). A positive strong correlation between Common market and Free trade ($r=0.989**, p=0.000<0.01$), positive moderate correlation between Common market and Custom union ($r=.364**, p=0.000<0.01$), positive moderate correlation between Common market and Custom union ($r=0.570**, p=0.000<0.01$). (Table 4.11).
Model Summary

Table 6 Model Summary

<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>.816a</td>
<td>.665</td>
<td>.657</td>
<td>.266</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), free trade, custom union, common market

Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable. From the findings in the above table, the value of adjusted R squared was 0.665, an indication that there was variation of 66.5% on the free trade, custom union, and common market at 95% confidence interval. This shows that 66.5% changes in cross-border economic development in Rwanda could be accounted for free trade, custom union, common market. R is the correlation coefficient which shows the relationship between the study variables. The findings show that there was a strong positive relationship between the study variables as shown by 0.816.

ANOVA*

Table 7: ANOVA*

<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>28.751</td>
<td>4</td>
<td>5.750</td>
<td>81.539</td>
<td>.000b</td>
</tr>
<tr>
<td>Residual</td>
<td>14.457</td>
<td>139</td>
<td>.071</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43.208</td>
<td>143</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: cross-border economic development in Rwanda
b. Predictors: (Constant), free trade, custom union, common market

From the ANOVA statistics in the table above, the processed data, which is the population parameters, had a significance level of 0.05 which shows that the data is ideal for making a conclusion on the population’s parameter as the value of significance (p-value) is less than 5%. The model between East African Community integration process and cross-border economic development in Rwanda. Shows that model was significant since the p-value was less than 0.05 without the interaction term, F (4, 139) 81.539, p<.0018. The significance value was less than 0.05 an indication that the model was statistically significant.

Multiple Regression Analysis

Table 8: Multiple Regression Analysis

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>Std. Error</th>
<th>t-Stats</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>1.076</td>
<td>0.333</td>
<td>3.233</td>
<td>0.001</td>
</tr>
<tr>
<td>Free trade</td>
<td>0.305</td>
<td>0.048</td>
<td>6.320</td>
<td>0.000</td>
</tr>
<tr>
<td>Custom union</td>
<td>0.482</td>
<td>0.046</td>
<td>10.436</td>
<td>0.000</td>
</tr>
<tr>
<td>Common market</td>
<td>0.183</td>
<td>0.037</td>
<td>4.953</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Dependent Variable: cross-border economic development in Rwanda
Therefore, the equations used within the study in two variables, the researcher used regression model being illustrated as:

\[ y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon \]

Where: cross-border economic development in Rwanda

= 1.076 +0.305 Free trade +0.482 Custom union + 0.183 Common markets

From the above regression equation it was revealed that free trade, custom union, common market on are holding to a constant zero , cross-border economic development in Rwanda would stand at 1.076, a unit increase Free trade would lead to increase in cross-border economic development in Rwanda by a factor of 0.305, unit increase in Custom union would lead to increase in cross-border economic development in Rwanda by a factor of 0.482 , a unit increase in Common market would lead to increase in cross-border economic development in Rwanda by a factor of 0.183 . Table 4.7 further show the summary showed that Free trade (0.305, p < 0.05); Custom union (0.482, p < 0.5) and Common market (0.183, p < 0.05) were all significant affecting the organizational performance.

### Hypothesis Testing

**Table 9:Hypothesis Testing**

<table>
<thead>
<tr>
<th>Research Hypotheses</th>
<th>P-value</th>
<th>β coefficient</th>
<th>Sig,</th>
<th>Decision on H₀</th>
</tr>
</thead>
<tbody>
<tr>
<td>H₀₁: There no statistically significant relationship r=0.360 between free trade East African and economic development in Rwanda</td>
<td></td>
<td>0.305</td>
<td>0.01</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₀₂: There no statistically significant relationship r=0.335 between East African custom union and economic development in Rwanda</td>
<td></td>
<td>0.482</td>
<td>0.00</td>
<td>Rejected</td>
</tr>
<tr>
<td>H₀₃: common market East African has no significant r=0.163 effect on cross-border Economic development in Rwanda;</td>
<td></td>
<td>0.183</td>
<td>0.00</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

**Dependent Variable: cross-border economic development in Rwanda**

### V. Discussion of the Research Findings

The first objective was to assess the effect of control environment on financial performance of The study felt that Free trade effect on cross-border economic development in Rwanda and it can be concluded that complete trade agreements on the removal of restrictions on trade encourage trade creation with member countries while lead to trade diversion with non-member states. Trade creation and diversion in the traditional, static welfare analysis. Free trade aimed at expanding trade, has been insufficient in optimizing the potential contribution of trade to cross-border trade development and reduce poverty. The present study concur with the findings from a research carried out by Firdaus (2011) on the effects of COMESA on manufacturing trade adopting dynamic general equilibrium model. The scholar discovered that FTA by COMESA member states including internal trade agreements with WTO, COMESA and ECOWAS may contribute to the cross-border trade development of members in general. Joining FTA lead to the expectation of GDP increase. Therefore, Rwanda could benefit from improved export as results of the accessibility to large market of other EAC member states.

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www.ijsrp.org
The study found that Custom union affects cross-border economic development in Rwanda. It can be concluded that, custom union on Asian four tigers using a mixed method with a gravity model analysis, discovered that the FTA led to the promotion of foreign direct investment by establishing higher combined marketplace international companies. Custom union serves as an important channel through which trade affects economic growth. However, the present study did not contradict the observation done in research carried out by Pearson and Chaitzey (2012) reiterates that a complicated trade procedures and strong regulatory requirements increase documentation processes required for trade transactions. However, insufficient customs and port-handling procedures, poor use of information technology and transit barriers feature as major aspects of TF, causing additional TTCs. Border transaction costs in South Asia can be as much as 50% higher than the developing countries of East Asia and the Pacific. The study found that Common market affects cross-border economic development in Rwanda. It can be concluded that common market under customs valuation deals with the truth or accuracy of the good’s declared value and is mainly inscribed in paragraph 8.3 of the Agreement on the Implementation of GATT Article VII and paragraph 12 of the Doha Ministerial Declaration. The present research is relevant since it concurs with the work of Renard (2011) who explains that the provisions on customs encapsulated in the agreement were planned to improve transparency. The agreements also need members to protect customs processes for exporting are relied on custom-to-business partnership adopted by the World Customs Organization (WCO).

VI. CONCLUSION AND RECOMMENDATIONS

The study included Free trade, Custom union, Common market which helped in examining the cross-border economic development in Rwanda. The study concluded that, custom union on Asian four tigers using a mixed method with a gravity model analysis, discovered that the FTA led to the promotion of foreign direct investment by establishing higher combined marketplace international companies. The study concluded that common market under customs valuation deals with the truth or accuracy of the good’s declared value and is mainly inscribed in paragraph 8.3 of the Agreement on the Implementation of GATT Article VII and paragraph 12 of the Doha Ministerial Declaration.

On Free trade, custom union should able to prevent the introduction of taxes between members that can possess impact of improving taxes to the high degree during the sign of a treaty establishing custom union. The cross border trade and immigration officials from the directorate of immigration and emigration as well as civil servants drawn from the line ministries should develop the coherent and synchronized of domestic economic regulations and strategies for the purpose of eliminating discrepancies and differences that are found in those regulations.

On East African customs union puts together all elements of free trade area and regulation protecting the freedom of movements of peoples and goods among partner countries, meanwhile it safeguard marketplace in the community from competitiveness of non-member countries. East African customs union should provide an opportunity for traders, both large multinationals and small and medium-sized enterprises (SMEs), to trade across Africa through a liberalized market for goods and services and create a single market for goods and services.

On East African common market, entrepreneurs involved in cross border trade and immigration officials from the directorate of immigration and emigration as well as civil servants drawn from the line ministries for instance the Ministry of East African, Ministry of Foreign Affairs and NGOs mandated with management of migration of persons should have Market specified that partner countries in the region would fortify economic cooperation, synchronization and bringing together all regulations and legal framework governing trades in the region.

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AUTHORS

First Author – Alphonse Nkubana, School of Social Sciences, Mount Kenya University, Kigali, Rwanda, Email of the corresponding author: nkubana12@gmail.com
Second Author – Dr. Eugenia Nkechi Irechukwa, School of Business and Economics, Mount Kenya University, Kigali, Rwanda
Probiotic Effectiveness in Artificial Feed Predigest on The Rearing of Tilapia (Oreochromis Niloticus) Larvae

Nurfadilah¹, Ruqayyah Jamaluddin¹, Muhammad Yusri Karim²

¹Faculty of Fisheries, Cokroaminoto University, Makassar, Indonesia
²Faculty of Marine and Fishery Sciences, Hasanuddin University, Makassar, Indonesia

Abstract- The main problem in the hatchery of tilapia (Oreochromis niloticus) is the low survival rate, especially in the larval to juvenile stages. One of the causes of the low survival rate is caused by the digestive organs of the larvae themselves which are still not perfect to digest the artificial feed given. This study aims to determine the optimum dose of the probiotic in rearing the best tilapia larvae. The study was carried out at the Aquatic UMK Fish Nursery Unit Widya, Tamalanrea, Makassar using a 30 L capacity green plastic basin filled with 25 L of media water. The test animals used were Tilapia larvae aged 7 days and kept for 30 days. The feed used was artificial feed in the form of powder and pellets mixed with probiotics. The study was designed using a completely randomized design consisting of 4 treatments with 3 replications each, thus this study consisted of 12 experimental units. The results of analysis of variance showed that the administration of the probiotic had a very significant effect (p < 0.01) on survival, daily growth rate, and stress resistance index of Tilapia larvae. The best survival and growth, and the best stress resistance index were produced at doses of 30 mg/100 g of feed by 79.77%, 14.37%/day, and 71.67, respectively.

Index Terms- growth, probiotic, stress resistance index, survival, tilapia larvae

I. INTRODUCTION

Tilapia is one type of fishery commodity with economic value, favored by the community because of its savory taste and nutritional value (Mapenzi and Mmochi, 2016; Nakkina, 2016; FAO, 2020). Tilapia has several advantages, among others; it has a fast growth rate and can reach a much larger body weight with a fairly high level of productivity. Tilapia fish also has a distinctive meat taste, the color of the meat is clean and white, without thorns with a fairly high nutritional content, so it is often used as a source of protein that is cheap and easy to obtain, and the selling price is affordable by the public (Hasyim et al., 2019; Mile et al., 2021). Judging from the productivity aspect, Tilapia is very potential and productive if it is cultivated in various fields, not only in lowland ponds but also in higher ponds.

The main problem in the development of Tilapia is the availability of seeds continuously and of good quality. Currently, efforts are being made to produce Tilapia seeds through hatcheries. However, the main problem faced in hatchery efforts is the low survival rate, especially in the larval phase (Jalaluddin, 2016). One of the causes of the low survival rate in larvae is that the digestive organs of the larvae themselves are still not perfect to digest the feed given. The larval phase is the most critical phase in the fish life cycle (Martinez et al., 2021). In general, the most suitable feed for larvae is natural food, but on a large scale, natural feed is not effective, so it needs to be substituted with artificial feed (Das et al., 2012; Kujawa et al., 2016). To make effective use of artificial feed for Tilapia larvae, it is necessary to predigest the artificial feed before giving it to the larvae.

Predigest is a simplification of feed nutrients from complex compounds to simpler ones, so that they can be maximally absorbed by larvae. Predigest artificial feed can be done using probiotics. Probiotics are additives that contain a number of bacteria (microbes) that can change the intestinal micro-colonies in such a way that beneficial microbes can thrive (Wuertz et al., 2021). Probiotics have the benefit of increasing appetite and spurring fish growth, increasing body resistance from virus and disease attacks, preventing stress and reducing mortality rates, eliminating bad odors in pond water, saving feed and accelerating the harvest period (Nai, 2015; Mesquita et al, 2021).

Research on the use of probiotics in artificial feed predigest has been carried out on finned fish (Jahangiri and Esteban, 2018), vaname shrimp larvae (Ramadhani and Sukenda, 2019), sangkuriang catfish (Manoppo et al., 2019). The results of this study indicate that the use of probiotics in feed can increase the survival and growth of fish and shrimp larvae. However, the role of probiotics on Tilapia larvae is not known for certain. Based on the description above, in order to evaluate the effect of giving probiotics on survival, growth, stress resistance, and quality of tilapia larvae, it is necessary to conduct research on this matter.

The purpose of this study was to determine the optimum dose of probiotics that resulted in the best survival, growth, and stress resistance levels of Tilapia larvae.

II. RESEARCH METHODS

The research was carried out at the Widya Aquatic UMK Fish Nursery Unit, Tamalanrea Jaya District, Makassar City. The study used a container in the form of a black plastic basin with a
capacity of 30 L filled with 25 L of media water. The test animals to be used were *Tilapia* larvae aged 7 days with an initial weight of 0.05 ± 0.01 g with an initial length of 1.2 ± 0.1 cm maintained for 30 days. The larvae were imported from a *Tilapia* hatchery in Yogyakarta.

The feed used is artificial feed in the form of powder and pellets. Feeding started on days 1 to 14 using MS Prima feed PF 0, and entering the 15th day until the end of the maintenance was given MS Prima Feed PF 500. The probiotic used was Bio-7 which was given by mixing it into the feed according to the treatment dose. Mixing is done by spraying probiotics into the feed. In order to maintain the root water quality is maintained according to the needs of the larvae, water changes are carried out. Water changes are carried out every day as much as 20% of the volume of media water.

The study was designed using a completely randomized design consisting of 4 treatments with 3 replications each, so that in this study there were 12 experimental units. The experiment that will be applied is the difference in the doses of the probiotic Bio-7 in rearing *Tilapia* larvae, namely doses of 0, 15, 30, and 45 mg/100 g of feed. The parameters studied were survival, growth, and the level of stress resistance of tilapia larvae. In addition, the water quality of the maintenance media was reduced, namely: temperature, pH, dissolved oxygen, and ammonia. The data obtained were analyzed using analysis of variance followed by further W-Tuckey test. To determine the evenness of the relationship as a treatment used regression analysis techniques. The water physicochemical data will be analyzed descriptively based on the viability of *Tilapia* larvae.

### III. RESULTS AND DISCUSSION

#### Result

The average value of survival rate, growth, and level of stress resistance of *Tilapia* larvae fed with probiotics in artificial feed predigest is presented in Table 1.

**Table 1. Survival, growth, and stress resistance of tilapia larvae fed various doses of probiotics in artificial feed predigest**

<table>
<thead>
<tr>
<th>Probiotic Dosage (mg/100 g Feed)</th>
<th>Survival Rate (%)</th>
<th>Growth</th>
<th>CSI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daily Weight (%)</td>
<td>Absolute Length (cm/tail)</td>
</tr>
<tr>
<td>0</td>
<td>57.67 ± 4.48&lt;sup&gt;c&lt;/sup&gt;</td>
<td>13.25 ± 0.19&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1.17 ± 0.06&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>15</td>
<td>73.44 ± 0.84&lt;sup&gt;b&lt;/sup&gt;</td>
<td>13.68 ± 0.17&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.60 ± 0.26&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>30</td>
<td>79.77 ± 0.19&lt;sup&gt;a&lt;/sup&gt;</td>
<td>14.37 ± 0.10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.83 ± 0.06&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>45</td>
<td>78.33 ± 0.67&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>14.25 ± 0.09&lt;sup&gt;a&lt;/sup&gt;</td>
<td>2.67 ± 0.15&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note: different letters in the same column indicate significant differences significantly

Between treatments at the 5% level (p < 0.05)

The results of the analysis of variance showed that the administration of probiotics had a very significant effect (p < 0.01) on the survival, growth, and stress resistance of tilapia larvae.

The relationship between the dose of probiotic and survival, daily growth rate, absolute body length growth, and stress resistance level of tilapia larvae with a quaternary pattern is shown in Figures 1, 2, 3, and 4.

**Figure 1. Curve of relationship between probiotic dose and larval survival rate of *Tilapia* larvae**
Based on the regression equation, it is predicted that the optimum probiotic dose for survival rate, daily weight growth rate, absolute length growth, and stress resistance level of Tilapia larvae were achieved at doses of 34.67; 37.14; 38.94; and 34.61 mg/100 g of feed.

As supporting data, during the research, measurements of several water quality parameters of the maintenance media were carried out as presented in Table 2 below.
The use of artificial feed predigested with probiotics in this study showed a positive response to survival, growth rate, absolute growth in body length, and stress resistance of tilapia larvae with a certain dose compared to the use of unpredigested feed. This is due to the work of probiotics which can simplify the composition of the feed used. Predigestion using probiotics is an effort to simplify the nutritional content of feed before being given to larvae. Predigested feed using probiotics has been carried out by several previous researchers, namely (LaraFlores, 2011; Arig et al., 2013; Abidi, 2014, Valipour et al., 2018; Borger et al., 2021) in that study showed that the use of probiotics in artificial feed predigested gave a significant effect on fish larvae.

Predigested feed is easier for fish to digest than unpredigested feed so that the energy needed by fish to digest food is less and the excess energy can be used to maintain fish life and growth. After predigestion, materials that most of the components are already in the form of simple compounds can be given as fish feed so that fish do not need to digest it anymore, but can already absorb it directly (Qazi et al., 2022; Herdiyanti et al., 2018).

Differences in survival, growth in weight and length, and levels of stress resistance between treatments can be influenced by the dose of probiotics given to the feed. Spraying probiotics on feed affects the speed of predigest feed in the digestive tract of larvae, thus helping the process of digestion and absorption of food essence. Predigest feed is able to break down complex compounds into simple ones so that they are ready for use by fish and a number of microorganisms are able to synthesize vitamins and amino acids needed by aquatic animal larvae (Sharma et al., 2020; Lein et al., 2022). The simpler form is expected to be more easily digested in the digestive tract and absorbed into the blood circulation even though the digestive organs of tilapia larvae are not yet perfect.

Probiotics are able to balance the digestive tract microbes so that they can increase the digestibility of fish by converting carbohydrates into lactic acid which can lower pH, thereby stimulating the production of endogenous enzymes to increase nutrient absorption, feed consumption, growth, and inhibit pathogenic organisms (Cauhan et al., 2018; Allameh et al., 2021). The results of this study showed that the administration of probiotics up to a dose of 30 mg/100 g of feed was able to increase survival, growth, and stress resistance. The high dose treatment (45 mg/100 g of feed) showed stagnant results in survival, growth and stress resistance of tilapia larvae even lower than the treatment (30 mg/100 g of feed) which was the best result. This is due to the imbalance between the bacteria already exist in the digestive tract and the bacteria that enter. The concentration of bacteria required in the amount must be right. If the number of bacteria is too much it will cause overgrowth. High bacterial density causes competition for high substrate or nutrient uptake so that bacterial activity is inhibited. Too many bacteria cause bacteria to rapidly sporulate (form spores) so that the function and activity of bacteria is not optimal. Based on the regression equations (Figures 1, 2, 3, and 4) it can be predicted that the optimum probiotic dose for survival, daily weight growth rate, absolute length growth, and stress resistance level of Tilapia larvae were achieved at doses of 34.67; 37.11; 38.94; and 34.61 mg/100 g of feed.

Probiotic microbes are microbes that are safe and relatively beneficial in the digestive tract of fish, these microbes produce substances that are not harmful to fish but instead destroy pathogenic microbes that interfere with the digestive system so that fish will be healthy and avoid diseases that can reduce the percentage of survival rates. Energy derived from feed is used for basic life activities such as basal metabolism, growth, gamete production, movement, breathing, digesting feed, temperature regulation and after that energy is used to sustain life. The survival rate of fish is influenced by good aquaculture management, including stocking density, feed quality, water quality, parasites or diseases and feed that has good nutrition plays an important role in maintaining the survival rate of fish (Mannan et al., 2012; Sultana et al., 2018).

With the presence of probiotic bacteria in the feed which then enters the digestive tract of the fish, it is able to suppress the pathogenic bacteria in the intestines, thus helping the digestion of feed faster. If the presence of probiotic bacteria in the digestive system of fish is lacking, the feed consumed by fish cannot be utilized optimally. In order for feed to be utilized optimally, it requires bacterial activity in digestion that enters through feed which causes a balance in the number of bacteria in the intestine so that it can suppress pathogenic bacteria (Mannan et al., 2021; Ronnested et al., 2013). By suppressing pathogenic bacteria in the digestive system of fish, it will prevent fish from diseases that can cause stress and affect fish growth and survival rates.

The results of measurements of several water quality parameters of the maintenance media showed that the temperature values of the maintenance media were 28-31°C, pH 7.2-7.8, dissolved oxygen 4.0-5.1 ppm, and ammonia 0.03-0.09 ppm. The range of water quality parameter values is still in a reasonable range for tilapia larvae. According to Alfaia et al. (2013) and Siniwoko (2013) that a good temperature for tilapia ranges from 25-30°C, pH 7.0-7.5 (Khairuman and Amri, 2013; Siniwoko, 2013), dissolved oxygen ranges from 4-7 ppm, and ammonia < 0.1 ppm water (Khairuman and Amri, 2013).

## IV. DISCUSSION

### Table 2. Range of water quality parameter values for tilapia larvae rearing media

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°C)</td>
<td>28-31</td>
</tr>
<tr>
<td>pH</td>
<td>7.2-7.8</td>
</tr>
<tr>
<td>Dissolved Oxygen (ppm)</td>
<td>4.0-5.1</td>
</tr>
<tr>
<td>Ammonia (ppm)</td>
<td>0.03-0.09</td>
</tr>
</tbody>
</table>

### References


Analyzing the effectiveness of Mobile Banking on Customer Satisfaction; A survey on the XYZ Bank PLC with specific reference to branch Thalawathugoda, Sri Lanka

U. A. Jayaweera

Northumbria University, Newcastle upon Tyne, England
Newcastle Business School

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Abstract: The banking sector in Sri Lanka is experiencing rapid high-tech advancements, which are forcing banks and financial institutions to adopt self-service technologies like internet banking, SMS banking, mobile banking, automated teller machines, cash deposit machines, etc. to provide convenient services and increase customer satisfaction. The purpose of the study is to investigate the effectiveness of mobile banking on customer satisfaction, in the context of XYZ Bank with specific reference to branch Thalawathugoda. The study used a convenience sampling technique to select 50 mobile banking users from a population of 1027 and then used an online survey to collect quantitative data. Accordingly, key findings revealed that lack of confidence and insecurity in mobile banking has a significant impact on customer satisfaction, while speed and convenience have moderate effectiveness. Consequently, based on the survey findings, recommendations were provided to the bank to improve customer satisfaction concerning mobile banking services.

Index Terms: convenience, customer satisfaction, electronic banking, mobile banking, privacy, reliability, speed, self-service technologies

I. INTRODUCTION

A reputable local financial institution, XYZ Bank PLC, has 53 leasing centres, 138 ATMs, 93 branches, and automated channels around the nation. It is one of Sri Lanka's listed service providers and is well-known locally (NTB annual report, 2017). Incorporated in 1999, XYZ Bank is the only issuer and acquirer of American Express credit cards in Sri Lanka. It is the seventh indigenous competitor in the country's banking sector (NTB annual report, 2017). The bank operates to assist people and corporations to realise their goals and future aspirations as a result, serving a diverse customer base that ranges from young children to multinational corporations (NTB, 2018). Due to a 16.3 % shift away from traditional banking practices to electronic banking in the preceding years, Sri Lanka has seen a tremendous increase in electronic and online banking (Premarathne & Gunatilake, 2016). A liberalised banking industry now exists in Sri Lanka, which has a significant influence on the country's economic growth (Samaranayake, 2016).

According to Daily News (2019), the country's banking sector is at a stage of the cycle known as growth that is intensifying, driven by internet and mobile banking due to increased smartphone penetration, which is represented by subscriptions to more than 30 million smartphones. Furthermore, due to a strong emphasis on ICT and innovation, banks increased their investments in e-banking and other self-service technologies by 71% in 2018 to expand their client base and compete in a fiercely competitive market (Daily News, 2019).

As a prominent bank in the nation, XYZ offers a variety of banking platforms that are compatible with the most recent mobile and multimedia technologies, according to an analysis of the company's present condition (NTB annual report, 2017). As a result, XYZ seeks to cohere its investments moving forward, supporting the development of digital banking, where the firm invested a total of USD 499 million in digital banking from 2014 to 2018. (NTB annual report, 2018). The graph below shows XYZ's incremental investment in digital banking.

Figure 1: Digital Banking Investments of XYZ (Source: Adapted from NTB Annual Report 2018).
Figure 1 shows that XYZ has raised its investments in digital banking substantially over the previous five years to update its services and boost returns on investments. The performance and net profit of the firm have, nonetheless, reduced from 43% in 2017 (NTB annual report, 2018), which is weaker in comparison to its rivals, as is evident from an analysis of XYZ's income records. As a result, XYZ now has a high-cost income ratio of 55.58 percent (NTB, 2018), which has a detrimental effect on the bank's overall performance and capital position (CS). The table below compares XYZ and its competitors' sales and costs so that a full analysis can be done.

Table 1: Overview of Sri Lankan Banks (Source: Adapted from Central Bank, 2019).

<table>
<thead>
<tr>
<th></th>
<th>Commercial Bank</th>
<th>Sampath Bank</th>
<th>Hatton National Bank</th>
<th>XYZ Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share Capital</td>
<td>17,986,360,000</td>
<td>3,553,888,000</td>
<td>12,557,363,000</td>
<td>5,101,369,000</td>
</tr>
<tr>
<td>Total Assets (LKR)</td>
<td>1,012,201,000,000</td>
<td>658,512,286,000</td>
<td>858,873,825,000</td>
<td>211,200,000,000</td>
</tr>
<tr>
<td>Net Income Cash Flow</td>
<td>10,150,077,000</td>
<td>6,066,580,000</td>
<td>3,328,071,000</td>
<td>1,035,036,000</td>
</tr>
<tr>
<td>Cost Income Ratio</td>
<td>51.06%</td>
<td>47.83%</td>
<td>42.50%</td>
<td>55.58%</td>
</tr>
<tr>
<td>Approximate NIPE (LKR)</td>
<td>4,000,000,000</td>
<td>2,300,000,000</td>
<td>2,300,000,000</td>
<td>1,040,000</td>
</tr>
<tr>
<td>Net Profit</td>
<td>14,466,000,000</td>
<td>9,124,670,000</td>
<td>13,050,000,000</td>
<td>2,711,209,000</td>
</tr>
</tbody>
</table>

In comparison to three other top banks in Sri Lanka, it can be seen from the highlighted areas above that XYZ's performance and net profit are below average. Figure 1 shows that the company has put a lot more money into developing e-banking each year. However, another part of XYZ shows that the number of M-banking app cancellations is going up by +95 per day, +665 per week, and +2,660 per month (NTB report, 2019). Due to this, the authorities explain that there may be a connection between the number of M-banking deactivations and the performance and revenue declines (NTB report, 2019), which have impacted the CS of XYZ as a whole.

In summary, it is recognized that XYZ is having trouble with M-banking, which has affected its CS. The usefulness of M-banking in raising CS at XYZ will be discussed in this study.

Problem Statement

Djajanto (2014) says that as digital technology has improved, businesses have been able to change their old business models and adapt how they run. This has helped them reach their goals and objectives more effectively and efficiently. This research is being done so that we can find out how M-banking affects CS. Fenu and Pau (2015) say that m-banking is a key part of the banking industry's development of different e-banking models to meet customer needs. Reviewing M-banking as a platform for e-banking, Daud et al. (2011) say that it is a service that consumers like as it is easy to use and available to a lot of people. Asongu (2013) says, one of the main reasons for the growth of M-banking is the rise in mobile phone subscriptions. This makes it easier for banks and other financial institutions to convince people to use M-banking services. But Dennis (2016) says that people do not use e-banking services because they do not know enough about them, they do not trust them, they are worried about security, and there are different opinions in the community. For example, the number of mobile phone users in Sri Lanka has grown a lot in the last few years, which means that M-banking could be more popular in that country (Gunawarden & Perera, 2015). Siqueira (2016) says that the growth of M-banking users is slower than the growth of mobile phone users. Because there are not any big-picture studies, it is important to research M-banking in Sri Lanka to identify why consumers are not getting used to it and are not satisfied with it as fast as they could be.

Research Objectives

The goal of this project is to look into and figure out how well M-banking works to analyze XYZ's current situation and make suggestions for how to improve the company's performance. The objectives of this study are as follows:

1. To review the literature to discover the concepts of M-banking and CS and their importance to corporates.
2. To identify secondary research to critically review the literature to investigate the effectiveness of M-banking on CS in the banking industry.
3. To identify primary research using online questionnaires distributed to the M-banking users of XYZ to identify the effectiveness of M-banking on CS.
4. To analyze the findings of the primary research, provide recommendations required and draw conclusions for XYZ in M-banking which could help increase CS.

II. LITERATURE REVIEW

Mobile Banking

The world of digital technology has been extensively revolutionized over the past decades since its origin as a binary computing process, being the most important force behind almost every industry in the world (Ebner & Schweighofer, 2015; Sheoran, 2012). Dennis's (2016) study shows that research on mobile banking does not get nearly as much attention as research on electronic banking. However, according to Nair and Samudra (2006), the development of M-banking, which is a subset of electronic banking, is presently thought to be the most important factor driving the banking industry. Mallat et al. (2004) define M-banking as performing transactions between accounts and seeing account balances while using a mobile device to access a bank's website. Rahman (2013) contends that in the context of the digital era, M-banking delivers services and information from banks to their clients through wireless application channels via mobile devices, tablets, or even smart devices. Asongu (2013) goes on to say that the main reason for the fast growth of M-banking facilities
Customer Satisfaction
Customer satisfaction (CS) is recognized as a crucial component of any organization's success in the sphere of business (Lin, 2017). Kotler (2011) says that customer satisfaction (CS) is a measure of how different a good or service is seen to be from how it was expected to perform in the past. Biesok (2011) gives a broader definition of the phrase as "customer requirements, desires, and objectives." This is when a good or service makes a customer feel happy and satisfied (Iliška, 2013; Ali, 2018). In contrast, Angelova (2011) says that CS is hard to measure because it leads to misunderstandings about how quality is seen. Hence, this shows that CS only changes if the performance meets or exceeds expectations (Morgan, 2006; Hallowell, 1996). Saner et al. (2016) say that different researchers have found that CS is a key important factor in the banking business. So, financial institutions are always trying to improve M-banking apps and their features to improve customer service (Ali, 2018). For example, KPMG (2018) says that between 2015 and 2016, several banks around the world quadrupled their M-banking budgets and kept them at that level all through 2017. According to Naik (2010), the five service dimensions of reliability, responsiveness, security, empathy, and tangibles based on the SERVQUAL model have an impact on M-banking contributing to banks’ CS, whereas Emel (2014) notes that reliability, responsiveness, and security are the three factors that have the greatest impact on CS.

Convenience
Collier and Kimes (2013) say that a product, service, or system's level of convenience is determined by how easy customers think it is to use. As a result, Ling (2016) asserts that convenience, also known as ease of use, is a mental effort that influences whether or not a user accepted it. So, Shilpa and Veena (2018) define convenience as the amount of work a consumer has to do to use facilities or services and enjoy the results. Hamid et al. (2018) note in their review of e-banking that convenience is a person's perception of how much e-banking will increase flexibility and be simple to learn and use. Customers have mostly shifted from conventional banking to M-banking due to factors like flexibility and efficiency, which highlights the need to enhance those features to maximize the convenience for CS (Shilpa & Veena, 2018).

Reliability
In customer service, reliability means being able to give customers what they want at a certain level, as well as being correct, on time, and up to date (Hammad et al., 2018). As a result, what makes e-banking reliable (Asfour & Haddad, 2014) is the accuracy of the information and other services offered, as well as how well the website or mobile app works technically. Shilpa and Veena (2018) elaborate that dependability is a key performance driver in the banking industry, which is very competitive because trust affects whether or not customers want to do business online and share private information. According to Berraies et al. (2017), the risks connected to M-banking might help to further explain the efficacy of dependability on CS. So, the unreliability of M-banking is lessened by the fact that M-banking programs are more likely to break down and upset customers than traditional banking methods (Hamid et al., 2018).

Speed
Ling (2016) says that speed with self-service technologies is the amount of time it takes to finish a service task using a machine or an established system. According to Fozi (2018), CS with SSTs will be dependent on a variety of characteristics, with speed being one of the most important. Furthermore, Chiu et al. (2017) emphasize that, according to Meuter, Ostrom, Roundtree, and Bittner, "speed continues to rank first among qualities" (2000). Due to the busy lives of consumers, Ling (2016) also says that speed is the strongest and most important factor in producing CS when SSTs like ATMs, CDMs, and mobile applications are used in the banking business. Hamid et al. (2018) say that people get used to M-banking because it helps them get around what they think are the time and place limits of service. In fact, according to studies, 60% of internet users say that the rapid development of mobile applications has caused them to make decisions and complete transactions more rapidly than they did in the past (Hamid et al., 2018). Chiu et al. (2017) say that banks need to give customers a good impression of how much time M-banking takes so that they can see the services as being quick and easy to use.

Privacy
According to Hammond et al. (2018), privacy is one of the most important judging factors for online financial transactions since it protects users from danger, peril, and uncertainty. Since client account privacy is very important, it is important to make sure that transaction data is correct and accurate (Ibrahim et al., 2016). So, Djalanto (2014) says that financial institutions should help protect the privacy of their customers by using high-security processes to protect their important client information when using current transaction methods. Becirovic (2011) says that all e-banking services cause consumers to worry about their privacy, which affects customer service. As proof, Chiu et al. (2017) show that customers' concerns about privacy led to laws that make it illegal for businesses to use their customers' information for other purposes. Consequently, Ling's (2016) research shows that customers are hesitant to use M-banking because they are worried about their privacy (Fozi, 2018).

Conceptual Framework
According to Maseke (2018), a conceptual framework is a theoretical structure of assumptions, principles, and rules that holds the notions comprising a broad concept. Therefore, according to this research study, the conceptual framework is illustrated below.
III. RESEARCH METHODOLOGY

Research Philosophy
Research philosophy is defined as a set of beliefs and expectations regarding the advancement of knowledge in a specific field of study (Asongu, 2013). As Saunders et al. (2003) state, understanding philosophy is vital to clarify the research methods to be used in a study. Based on this study, the positivism approach has been selected by the author as it asserts a series of measures that could be identified as a specific variation of the actions of people or associations between people. In addition, the research of Asongu (2013) and Sequeira (2016) used positivism, which often involves the manipulation of reality based on the use of independent variables.

Research Approach
As Sequeira (2016) identifies the research approach is a process that contains steps of assumptions to a comprehensive process of data collection, analysis, and interpretation. Also, when the author used the deductive method, he or she followed the path of logic more closely. This led to observations that proved and contradicted each other, which either led to a confirmation or a denial. Consequently, the data collected for the study were analyzed to prove or disprove particular situations, which directed the author to establish new ideas and trends as recommendations. Hence, the author used the steps given when he or she used the deductive method to do the study.

Research Strategy
As Saunders et al. (2009) state, a research strategy is the “general plan of how the researcher will go about answering the research questions.” Therefore, the significance and choice of the strategy rely on research objectives, time, knowledge, and philosophical reinforcements (Thomas, 2001). The table given below outlines the frequently used strategies in dissertations. For this study, a survey was used as the study focused on the CS of M-banking of a selected organization. As a result, the survey allowed independence for the author to gather various types of information, which strengthened the outcome of the project.

IV. RESEARCH FINDINGS

Demographic Analysis

Age and Gender
This part of the chapter looks at the answers to the demographic profile questions given by 50 M-banking users of XYZ. The highest age distribution of the respondents can be identified as 36% from age 25 to 34, which includes 12 female and 2 male respondents, whereas the lowest response rate is 4% from age above 55.
As a result, 24% of those aged 18 to 24, 20% of those aged 35 to 44, and 12% of those aged 45 to 54 participated in the survey. However, what stands out in this graph is that female respondents have the highest participation in the survey, which is 62%, whereas the participation of male respondents is 38%.

**Educational qualifications and Employment Status**

The educational qualification section clarifies that the majority of the respondents are postgraduates (32%), whereas the lowest responses are from undergraduates and advanced-level qualifiers (22% each). Further, the second-highest responses (24%) were received from professional qualification holders. The employment status shows that 74% of respondents are employed and 18% are students. However, it is discovered that the lowest responses are gathered from unemployed M-banking users, which is only 8%. The highest number of respondents (30%) have been banking with XYZ for 2 to 5 years, whereas only 8% of the respondents have been using XYZ services for more than 15 years. Further, the results show that 26% of respondents have been banking with XYZ for 6 to 10 years, while 24% have been banking for less than 2 years.
Furthermore, 52% of the respondents are using M-banking due to its convenience, whereas 34% and 8% use the facility since it is speedy and reliable. But the pie chart also shows that only 6% of the people in the sample use M-banking because it keeps their privacy safe. Secondly, respondents frequently use ATMs, which means 32% use M-banking and 16% use internet banking. More importantly, the results demonstrate that only 4 respondents, or 8%, use POS machines.

Considering convenience, 80% of respondents agree that XYZ M-banking enables its customers to use M-banking services at anytime, anywhere, whereas over 75% agree that in terms of convenience, responses show that M-banking is more flexible and faster than traditional banking methods. So, this finding backs up what Goel (2015) found in the literature: that the speed and flexibility of e-banking can improve CS. 50% of those who answered agree that XYZ's mobile app has the right language support for its customers to make transactions. But 42% of people, which is closer to the agreed-upon response rate, say that XYZ does not help them with their transactions in their own language. As a result, it can be seen that the instructions for the XYZ mobile app are only in English. This may have made 42% of respondents disagree with the statement that English is the national language since Sinhala is not included in the app. Masoud and AbuTaqa (2017) say that the ease of use could be improved by adding features like letting users change the language and interface of the mobile app based on their knowledge of technology, age, and other needs. This would also increase customer satisfaction.

Reviewing reliability, a striking finding could be observed as 66% of respondents disagree that M-banking is more reliable than ordinary banking techniques, whereas only 32% agree with the statement. Therefore, this finding is contrary to that of Hammoud et al. (2018), who view M-banking as a more reliable process of banking than traditional methods. However, 54% of respondents agree with the statement, which proves that XYZ often updates and maintains its mobile application to provide malfunction-free, reliable services to its customers.

56% of respondents believe that XYZ M-banking has a lack of security and risks. Also, 54% do not trust the company to solve problems with M-banking quickly when they come up. Therefore, by analyzing the responses, causes identified for the high rate of disagreements and measures of the reliability of the XYZ M-banking application are security concerns and risks such as viruses, insecure Wi-Fi networks, unauthorized third-party hacking, phishing scams, etcetera (Tembely, 2017). In fact, the discussion above is in accordance with the literature of Hamid et al. (2018), which implies malfunctions and error-prone e-banking services could cause frustration and distress in users, thus lowering the reliability and CS.

In terms of speed, 78% of people who answered the survey agree that M-banking is a great way to get around what people think are time and location limits at banks and other smart banking locations. In the same way, the speed of an M-banking app is one of the most important things that customers look for before using it. This is because many people do not want to spend more time at the bank making transactions in person (Chiu et al., 2017). As a reason, it can be seen that XYZ only has 93 branches, 127 ATMs and 45 CDMs, which is low compared to other banks in Sri Lanka. Because of this, customers of XYZ were more likely to have to wait in line for paperwork at the bank, which made them unhappy and led them to switch to other banks with better e-banking services. 34% of respondents state that there is a propensity to move from XYZ to another service provider considering their CS.

When it comes to privacy, 54% of respondents agree that M-banking provides more privacy than traditional banking methods, while only 30% of negative responses are received as disagreements. As Hammoud et al., So, these results back up the previous survey on M-banking privacy, which found that 89.43% of M-banking users around the world are worried about security and privacy policies because their savings and personal information are linked to the M-banking app (Berraies et al., 2017). As they say (2018), privacy is one of the most important things to look at when judging customers’ online financial activities because it gives them control over risks and danger. Therefore, these findings support the previous survey on M-banking privacy, which indicates that 89.43% of users of M-banking across the globe are apprehensive about security and privacy. Customers’ savings and personal data are linked with the M-banking application (Berraies et al., 2017).

56% of the people who responded disagreed with the statement because they do not feel safe using M-banking apps to make transactions. As a result, these findings may indicate customer insecurities about M-banking, which have led to the development of a lack of confidence. 55% of respondents disagree with the statement, even though the company has taken important steps to make people aware of its privacy policies. This suggests that XYZ’s M-banking instruction process is not as good as it could be. In reviewing results, an even distribution of both agree and disagree responses can be observed, which proves that M-banking users, in the context of Sri Lankan society, are weaker in overall knowledge of e-banking concepts than e-banking accounts, which are freely installed by their respective banking service providers without delivering an overview of the service.

Through the literature review, the first two objectives of the study have been successfully attained. In fact, the first objective, reviewing the concepts of M-banking and CS, has been completed with the use of critical discussions and literature by multiple authors, whereas the second objective was fulfilled using literature and statistics related to theoretical and empirical studies. The third objective of the research has been achieved with the conduction of a survey and analysis of data. Accordingly, a
questionnaire comprised of 7 demographics and 19 Likert scale questions was distributed among 175 M-banking users of XYZ, and 50 responses were analyzed and measured through Microsoft Excel to identify the effectiveness of M-banking on CS. The final objective of the research was achieved and the author analyzed issues identified in terms of M-banking and CS at XYZ. The recommendations are provided to the company to overcome the identified issues.

Recommendations

As of right now, 2,660 more people are deactivating the XYZ M-banking app every month, even though the company has been investing a lot more money into the development of e-banking every year. The following points discuss the recommendations for three key issues related to XYZ M-banking.

- Developing a mobile application that consists of multiple languages would create a competitive advantage for XYZ as there is no M-banking application that gives many language options to the customers in the country.
- Establish a special department or a team of individuals; dedicated to customer relationships 24 hours in order to degrade customer frustrations and complaints, since support is highly required when dealing with modern banking technologies.
- Provide comprehensive instructions on how customers’ privacy is protected in mobile transactions prior to an M-banking app installation.

CONCLUSION

This research project was conducted to find out how well M-banking works for CS at XYZ, with a focus on the branch in Thalawathugoda. Overall, the results of this study show how important it is for M-banking service providers to take the steps needed to deal with customer service issues.

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AUTHORS

First Author – Jayaweera, U., ACIM. Chartered Institute of Marketing, BSc. (Hons), Northumbria University
Role of Libyan diplomacy in resolving internal conflicts of the state in the future

Mohammed Ali Elsherif
phd.candidate

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Abstract- The main goals of official diplomacy today are to build diplomatic relations between states and maintain them. The conceptual assessment of public diplomacy would not be complete without reference to soft power or, at least, in a special way of exerting influence. The fundamental debate follows the notion of public opinion since its inception, i.e. the question of whether and to what extent the mass public should play a role in government affairs, where social media provides users with a comprehensive and rich experience for participation, interaction and cooperation.

Index Terms- goals, diplomacy, public affairs

I. INTRODUCTION

In their attempt to influence public opinion, governments today rely on two main bodies: a complex of public communication experts and the media. With the emergence of new media and their wide use in all spheres of social life, they began to be used for public diplomacy activities. In fact, since public communication professionals largely, though not exclusively, rely on the use of media channels in their work, they can generally be seen as a sort of intermediary between the administration and the media. This does not mean that the media, at least in an environment with little freedom of the press, emerges only as an instrument of government opinion.

II. SUBJECT OF RESEARCH

Official diplomacy is a term often used in history to describe the conduct of negotiations between rulers aimed at conflict resolution, arbitration, mediation, negotiations and conferences. It is considered the primary peace tool of a country's foreign policy Public diplomacy, as a specific form taken by the practice of government communication with foreign audiences in the second half of the twentieth century, is a characteristic product of the development and final intersection of several discrete, though somehow connected, social and political concepts. The tensions and diversity underlying the contemporary understanding of public diplomacy may contribute to the relative confusion that surrounds it, but they are also what give the concept and its practice its dynamism, controversy and relevance.

The concept of public opinion is inherent in the mission of public diplomacy to seduce, influence or engage the foreign public, civil society and the information age are in fact repeatedly mentioned as factors taken into account in formulating a "new public diplomacy" adapted to our times. But while the mention of these three terms in the context of the public diplomacy discussion is frequent, it is mostly limited to referring to them as a kind of necessity, i.e. as an acknowledgment of the way they stand today and the implications they may have for the future of public diplomacy.

Cultural diplomacy has, in general, attracted little academic attention, much less than public diplomacy. However, Mark (Mark) argues that when it comes to presenting a national image abroad, cultural diplomacy can serve as a filter for the automatic suspicion that the public might have of the official message presented to them by governments. It can also serve as a message that is easier to get across to people, without the worry of hidden government agendas behind it.

Cultural diplomacy, like public diplomacy, is considered the so-called "soft power" of international relations, meaning that it has the ability to shape the preferences of others through attraction and attraction. The term "culture" refers to a complex whole, which includes knowledge, belief, art, morality, law, customs and all other abilities and habits that a person has acquired as a member of society. Observing the goals of cultural diplomacy, it can be seen that they do not differ from the goals of public diplomacy. Cultural diplomacy serves as an effective tool in support of the national foreign policy agenda.

III. THE AIM OF THE RESEARCH

The research in this dissertation tries to provide a comprehensive overview and understanding of the problematic role of Libyan diplomacy in solving the internal conflicts of the state in the future. It is expected that this research will show the ways in which diplomacy has worked throughout history and what are the main characteristics of contemporary diplomacy. The temporal subject of the research covers the period from October to December 2021. The collection of reference sources mainly focuses on scientific studies and books in Serbian and English. The doctoral dissertation includes primary research, i.e. survey research of respondents’ attitudes.
The research that is necessary for the purposes of this doctoral dissertation is based on multidisciplinary theoretical analysis and quantitative and qualitative research of public attitudes. The subject of the work requires access to a wide range of scientific fields such as: communication, law, psychology and sociology. In terms of time, the subject of the research covers the period from December 2021 to March 2022. Spatially, the subject of the research includes the analysis of the attitudes of respondents in the territory of the Republic of Libya.

Disciplinarily, the subject of research belongs to the field of social and humanistic sciences, the scientific field of legal sciences, the narrower scientific field of public legal sciences, and mainly the scientific disciplines of diplomatic law, and partly also the field of communication and public relations. The general goal of the research is related to the collection of literature, that is, the existing scientific understanding of issues related to the conceptual and structural determination of digital diplomacy as a new phenomenon in the field of international relations. Considering the fact that it is a modern transformation of public diplomacy, the scientific public has not yet given its full contribution to the understanding of this topic. Empirical research, which was conducted by surveying respondents, provided data to prove the set hypotheses. The dissertation aims to achieve specific scientific and social goals.

Hypotheses
The research will be based on the basic hypothesis that reads: 

**H0:** If the state of Libya effectively carries out its diplomatic activities, the greater the possibility that it will avoid internal conflicts in the future.

Auxiliary hypotheses (necessary to prove the basic hypothesis): 

**H1:** If the state of Libya pays more attention to digital diplomacy, the greater the possibility that the population will be involved in solving political issues.

Methods applied in research Different methods will be used in proving the set basic and auxiliary hypotheses in order to satisfy the basic methodological requirements, such as objectivity, systematicity, reliability and generality or the possibility of the widest application. It will start from previous research of scientific and theoretical knowledge, relevant literature and contemporary diplomatic practice. In the process of data collection, the methodologies of analysis, deduction, independent reasoning, comparison, and survey methods will be used. In data processing, statistical methods will be used, which will be used to validate the scientific and social goal of the research.

IV. RESEARCH AREA

1. The research will be conducted on a sample of about 274 participants from the territory of the Republic of Libya. We will collect the demographic characteristics of the research participants, which we will divide by categories in relation to: gender, age, level of education and work experience. The test will assess the knowledge of computer use and knowledge of software packages for the research participants, as these skills are necessary for modern diplomacy.

2. We will survey all participants about their views on the 20 statements contained in the Survey Questionnaire.

The analysis of the results will be done using descriptive and comparative statistics of the SPSS for Windows program package. The relationship between the observed variables will be examined with the Pearson correlation test. The difference or association is considered statistically significant if the probability is $p<0.05$, and highly statistically significant if $p<0.01$.

V. SCIENTIFIC AND SOCIAL JUSTIFICATION OF RESEARCH

The scientific goal that is to be achieved within this doctoral dissertation refers to the provision of relevant indicators, obtained by using scientific methods within the framework of qualitative and quantitative research with the intention of introducing these results to the scientific community. During the preparation of this work, the analysis of scientific texts will be used, as well as the survey of respondents' views. With regard to the scientific justification of the research, it is based on the fact that the functioning of modern diplomacy, which takes place on the platform of new media, is insufficiently researched. Considering that the academic public is just starting to study the field of digital diplomacy, as a new segment of public diplomacy, the scientific justification of the doctoral dissertation research is reflected in the opportunity to improve the understanding of the new form of diplomacy and the possibility of implementing new knowledge in diplomatic strategies in the future.

Using the historical method, synthesis, analysis, induction and deduction, within the framework of the research, the obtained results will serve for further analysis of the issue of influence. The obtained results should serve scientific workers dealing with this field for their further research.

The social goals of the research are related to the application of the acquired knowledge, with the aim of providing the necessary information, which should result in a more efficient recognition of the problem, but also the reliance of interested subjects on the methods of modern diplomacy.

The social goal as a kind of framework goal of the organization is in the first place. It could be defined as the realization of the needs of society, i.e. the satisfaction of the population's life needs, material, and to a considerable extent also of a spiritual nature, while minimizing negative impacts in its environment, ecological and sociological nature, at a certain level of well-being.

Official diplomacy is a term often used in history to describe the conduct of negotiations between rulers aimed at conflict resolution, arbitration, mediation, negotiations and conferences. It is implemented both bilaterally and multilaterally. The difference between official and unofficial diplomacy is the participants: official diplomacy is conducted only between governments and government representatives. Often, the visit of the president of one country to meet with the president of another country carries the effect of public diplomacy and inspires cultural diplomacy, but the main essential element of the visit is not the meeting between the election candidate and the general public, but between the statesmen or diplomats themselves.

Cultural diplomacy, like public diplomacy, is considered the so-called "soft power" of international relations, meaning that it has the ability to shape the preferences of others through attraction and attraction. Unlike the term "culture", which is known to be problematic in terms of its definition, the definition
of "cultural diplomacy" appears to be remarkably consistent. Ninković’s broad understanding of cultural diplomacy can be summed up as the promotion of the understanding of a certain country's culture abroad.

The term "culture" refers to a complex whole, which includes knowledge, belief, art, morality, law, customs and all other abilities and habits that a person has acquired as a member of society. Observing the goals of cultural diplomacy, it can be seen that they do not differ from the goals of public diplomacy. Cultural diplomacy serves as an effective tool in support of the national foreign policy agenda. The primary reason for a state to use cultural diplomacy is to influence foreign audiences and use this influence to gain support.

There are different reasons behind this - some countries seek support for certain policies or political decisions, others use cultural diplomacy for economic reasons and aim to make their countries appear more attractive for travel or investment. Although cultural diplomacy is quite underrated, compared to public diplomacy, there are many arguments in favor of the need to practice it.

Cultural diplomacy, like public diplomacy, is considered the so-called "soft power" of international relations, meaning that it has the ability to shape the preferences of others through attraction and attraction. The term "culture" refers to a complex whole, which includes knowledge, belief, art, morality, law, customs and all other abilities and habits that a person has acquired as a member of society. Observing the goals of cultural diplomacy, it can be seen that they do not differ from the goals of public diplomacy. Cultural diplomacy serves as an effective tool in support of the national foreign policy agenda.

In this traditional view, public diplomacy is seen as an integral part of diplomacy between states, which implies conducting official relations, usually privately, between official representatives (leaders and diplomats) representing sovereign states. In this sense, public diplomacy includes activities such as educational exchange programs for scholars and students; visitor programs; language training; cultural events and exchanges; and radio and television broadcasting.

E-Diplomacy represents another set of activities, the collection and analysis of data from the foreign public, which is collected by listening to discourses in the field. This suggests that digital diplomacy should be seen, according to Holmes, as a method of managing change, especially the small types of change that would be difficult to detect with the human eye. Critically, the existence of digital diplomacy does not imply that traditional face-to-face diplomacy is no longer necessary, quite the opposite.

Governments and international organizations must develop new systems to effectively assess their social media performance and see how it contributes to achieving their strategic goals. Learning how to use the metrics, analytics and data enabled by technology to track information to reach and engage potential audiences is of fundamental importance. Most missions now have websites that provide information on travel advice, application procedures and website forms. ICT adaptation is increasingly becoming a critical tool in high-level diplomatic negotiations.

Libyan politics believes that Arab national security will only be achieved through Arab unity, accordingly, Libya calls on all Arabs (both in Asia and Africa) to join the Arab-African empire and face the challenge of modern global affairs. Libya also sees the need to strengthen the strategic dimension of Arab national security by securing support from African states. The Arab world has a strategic geographical location that connects three continents - Africa, Asia and Europe - through various sea lanes that control global shipping. In addition, the Arab world possesses vast natural resources such as oil and agricultural land, as well as large capital. The Arab world is also united through language, religion, civilization, history and culture, as well as the natural ties between the Arab people. As part of its anticipation of Arab national security, Libyan policy does not recognize the presence of artificial state borders between Arab countries that have been - and continue to be - an obstacle to Arab unity. Libya called for the need to remove these borders that were the result of imperialist states during the era of colonization. In this context, the leader of the Libyan revolution states that these borders are what remains of imperialism and that we should work to remove them because they are part of the struggle for freedom. Imperialism cannot disappear while its remnants are intact, because the remnants of imperialism are more dangerous than its actual presence.

According to the Libyan perception of Arab national security, there are various sources of threats that may be of importance to Arab stability and security. These sources aim to stop efforts towards Arab unity. After reviewing the literature in this paper, several key questions arise, first, could the international community have avoided the use of force in Libya through alternative diplomatic means? If diplomacy is understood as the management of international relations through negotiations, then the failure of negotiations to find a peaceful solution to the issue is a conflict of interest and qualifies as a failure of diplomacy.

Overview of the results obtained by testing the set hypotheses Has diplomacy succeeded or failed in Libya? International military intervention is the result of a strategy of coercive diplomacy in the UN. At this point, our consideration of diplomacy can no longer remain separate from the broader debate about the role of morality in international affairs, which has been reignited by the Libyan crisis. Diplomacy itself is a paradox: although it has historically been idealized as an antidote to power, it can more accurately be understood as an instrument of power. Like any instrument, diplomacy is morally neutral. It is neither good nor bad, and the morality or immorality of its outcome ultimately depends on who owns it, when, why and how. One can agree, with Benjamin Franklin, that there has never been a good war or a bad peace. But what about the gray areas between both moral absolutes? There is hardly anything good about the kind of peace that Tacitus described as the desolation they make and call peace.

It is obvious that the motives behind the diplomatic and armed involvement in Libyan affairs have remained shrouded in mystery as far as they were justified and benevolent. The good intentions of those in positions of power are debatable in the case of many other countries as well. "The winners write the history" is an old and worn-out saying, which in modern times can be reformulated into the fact that history or truth is created by the powerful who have control over the media and create the attitudes of public opinion according to their own needs.

Civil activism during the Arab Spring helped in the organization of demonstrations, the exchange of ideas and above all in broadcasting the "other side of the truth". Maybe that is the
way, the way out of the confused period in which the people of Libya are still today.

The new media is a weapon that prevents both the governments of countries and world powers from justifying their activities with "distorted truth". The field of digital diplomacy is becoming increasingly aware of these benefits. Involving ordinary people in the exchange of opinions and enabling interactivity through digital media will enable greater transparency in matters of national importance. Such activities can have the effect of building a better image of the country in the international framework and lead indirectly to greater social and economic stability and the end of internal conflicts in Libya.

To check the justification of the general hypothesis: H0, which reads: If the Libyan state effectively implements its diplomatic activities, the greater the possibility that it will avoid internal conflicts in the future, we tested the following research questions:

P1. Do you agree with the statement that the state of Libya effectively implements its diplomatic activities?

P2. Do you agree with the statement that the state of Libya is still facing internal conflicts in the country?

The result shown in the tables shows that H2 (16,1)= 141.301a, p <0.01, which means that a statistically significant correlation has been established between the respondents' attitudes. Pearson's r =.546 and Spearman's Ro = .554 indicate a strong positive correlation.

Based on the statistical processing of the tested variables, we conclude that the general hypothesis: If the state of Libya effectively implements its diplomatic activities, the greater the possibility that it will avoid internal conflicts in the future is proven.

VI. TESTING OF SPECIFIC HYPOTHESES

To check the validity of the first special hypothesis H1, which reads: If the Libyan state pays more attention to digital diplomacy, the greater the possibility that the population will be involved in solving political issues, we tested the following research questions:

P3. Do you agree with the statement that the Libyan state pays enough attention to digital diplomacy?

P4. Do you agree with the statement that the inhabitants of the state of Libya are sufficiently involved in solving political issues?

The result shown in the tables shows that H2 (16,1)= 361.141a, p <0.01, which means that a statistically significant correlation was established between the respondents' attitudes. Pearson's r =.597 and Spearman Correlation Ro=.568 indicate a strong positive correlation.

Based on the statistical processing of the tested variables, we conclude that the first special hypothesis: - If the state of Libya pays more attention to digital diplomacy, the greater the possibility that the population will be involved in solving political issues is proven.

To check the validity of the second special hypothesis H2, which reads: If during the civil war the population uses digital media for civil activism, the greater the chance that the world will hear the real truth about the situation in that country, we tested the following research questions:

P5. Do you agree with the statement that in the period of civil war, the population should use digital media for civil activism?

P6. Do you agree with the statement that social media is a useful tool in times of war to inform the world with the real truth? The result shown in the tables shows that H2 (16,1)= 127.391a, p <0.01, which means that a statistically significant correlation has been established between the respondents' attitudes. Pearson's r =.555 and Spearman Correlation Ro=.535 indicate a strong positive correlation. Based on the statistical processing of the tested variables, we conclude that the second special hypothesis: If during the civil war the population uses digital media for civil activism, the greater the chance that the world will hear the real truth about the situation in that country - proven.

To check the validity of the second special hypothesis H3, which reads: If foreign countries interfere too much in the internal affairs of other countries, the greater the chance that the crisis in that country will deepen even more, we tested the following research questions:

P7. Do you agree with the statement that certain countries interfere too much in the internal affairs of other countries?

P8. Do you agree with the statement that foreign interference in the internal affairs of other countries can further deepen the existing crisis?

The result shown in the tables shows that H2 (16,1)= 127.391a, p <0.01, which means that a statistically significant correlation has been established between the respondents' attitudes. Pearson's r =.456 and Spearman Correlation Ro=.443 indicate a medium positive correlation.

Based on the statistical processing of the tested variables, we conclude that the third special hypothesis: - If foreign countries interfere too much in the internal affairs of other countries, the greater the chance that the crisis in that country will deepen even more is proven.

AUTHORS

First Author – Mohammed Ali Elsherif  phd.candidate
Food sovereignty practices among smallholder farming households along the staple food crop value chain in western Kenya.

1Owino Harriet Nyakecho; 2Mugalavai Violet Kadenyeka, 1Tsawe-Munga Chidongo; & 1Joshua Stephen Muoki

1Pwani University;
2University of Eldoret

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Abstract- This study was designed to highlight the food sovereignty practices of the respondents in the context of African spirituality of smallholder farmers in Matayos Sub-County of Busia County Kenya, and its impact on their food security status. Quantitative survey data was collected from 399 households using self-administered questionnaires, whereas qualitative data was derived from focus group discussions and case studies and reported verbatim. The results indicated that being custodians of the culture and traditions in African spirituality through the staple food crop value chain, the elders cared for the environment and passed the knowledge to younger generations in various food sovereignty practices through both learned modern and traditional farm practices including land preparation, planting, harvesting, post-harvest handling, processing and utilization of food for better food security of the farm households. The size of land was a limiting factor in attaining food security as the family size increased. There is need to address challenges in resource poor households and also engage in positive integration of food sovereignty and African spirituality practices for a better food system environment, consciousness and perception towards food secure rural households and the Nation at large.

Index Terms- Food systems, food sovereignty, African spirituality, food security

I. FOOD SOVEREIGNTY: A SNAPSHOT

Food sovereignty addresses food systems including the means of production and how the means of production either result in boosting of produce or creates a loss of production. According to Altieri,1993 and Gliessman,1998 high vegetational diversity and a multifaceted system of indigenous knowledge are the salient features of traditional farming systems and food sovereignty in developing countries. On the other hand, Holt and Gimenez (2006) in their book, Campesio a Campesio: Voices from Latin America’s Farmer to Farmer Movement for Sustainable Agriculture discusses how in Central America, tens of thousands of peasants have recovered eroded hillsides and restored and boosted productivity through the farmer to farmer agroecology movement. Agroecological methods in farming can be an indicator of food sovereignty since agroecology is restorative and draws from a respect of the land in its natural form and develops it to its optimum level since modern industrial monoculture degrades soils and drives the loss of productivity.

The Action group on Erosion, Technology and Concentration- ETC (2009), focuses on the population of peasants or smallholder farmers on the planet and establishes that there are 1.5 billion peasants on 380 million farms; 800 million more growing urban gardens; 410 million gathering the hidden harvests of our forests and savannas; 190 million pastoralists and well over 100 million are peasant fishers and at least 370 million of these are also indigenous peoples. They illustrate how together these peasants make up almost half the world’s peoples and they grow at least 70% of the world’s food. ETC (2009) is relevant because they provide a statistical background on the importance of smallholder farmers in establishing food sovereignty in their communities.

Statistics from Brazil by La Via Campesia (2008) show that despite the fact that agribusiness controls the majority of arable land and especially of good quality land, in almost every country in the world it is due largely to peasants and family farmers that we have food that is available today where rural farmers continue the food sovereignty practices as passed down by their elders and continue to be recognized as the custodians of natural resources including biodiversity (Chhatre and Agrawal 2008). It is farmers who continue to preserve the best seed genotypes through unique and valuable traits within their herds and traditional crop varieties that tolerate environmental stresses including climate change (Gonzalez 2010). In country after country, smallholder farmers control less than half of the farm and yet produce the majority of the food that is consumed. Smallholder farmers produce most of the food that is available.

FAO (2010) makes remarks on the global food crisis of 2007-2008 which was marked by skyrocketing food prices, urban food riots and the continued displacement of the rural poor. All this was a clear indication that the dominant model of agricultural
development had not succeeded in eradicating poverty or world hunger. Some countries like Haiti, Bangladesh, Egypt, West and Central Africa and countless other locations saw hundreds of thousands of people taking to the streets demanding affordable food. The more recent figures from FAO of the UN (2019) indicate that the ranks of the hungry are continuing to swell and now encompass more than one billion people, an increase of over 25% in the number of people without food since the mid-1990s. The information from the study by FAO (2019) shows that there has to be a different approach to ending hunger and malnutrition on the planet which includes looking back at cultural and spiritual values that ensured that communities were able to sustainably feed themselves. In the recent past, food security was not an issue because many communities were in control of their food production.

Another ecological intervention on farming systems is illustrated by Teodoro Mendoza (2002) in a research done in the Philippines which shows that rice yields in organic farms are 37.4% higher than in conventional farms during the dry season. The research shows that not only is the yield in tons per ha higher on organic farms, but the grains in the panicle are also heavier. Filled grains per panicle were the highest in organic farms while percent unfilled grains were comparable in organic and conventional farms. Mendoza (2008) study shows that organic farming could be a more sustainable farming system for cereals and legumes and is relevant to the study since the focus of the food sovereignty will be on the staple food crop value chain. Peter Rosset (1999) in his study titled The Multiple Functions and Benefits of Small Farm Agriculture in the Context of Global Trade Negotiations also argues that despite the common misconception that the industrial farming systems of agribusiness are the most productive, many studies have shown in recent years that small farms are more productive than large farms. Badgley et al. (2007), Pretty and Hine (2001) and Pretty et al., (2003) also posit that agroecological, sustainable and/or organic systems are as productive and, in many cases, more productive than chemical dependent monocultures because the most productive systems per unit area are highly integrated agroecological systems on small farms. Their arguments are relevant to this study because these organic, agroecological and sustainable ways of farming are systems used by smallholder farmers to produce food and might provide information on the spirituality of smallholder farmers through the staple food crop value chain. Badgley et al (2007), highlights research which shows that in developing countries organic farming systems on the average yield 2.7% times more per hectare than do non organic systems. In developing countries, they yield about the same while on a global level they yield 1.3 times as much. This information is important to the study because it shows how indigenous farming systems are a vehicle towards recognizing the democratic ownership of food systems through food sovereignty.

According to La Via Campesina, (2008) agroecological farms are substantially more productive both per unit area and per amount of labor. Machin Sosa et al. (2010), further illustrates that a more integrated farm is one that combines crops and livestock, inter-crops, rotates crops, employs agroforestry and generally exhibits a higher level of functional biodiversity. Such systems are seen as not only more productive but have far lower costs especially in terms of expensive farm chemicals and machinery. Their study argues that smallholder households and their farming systems are an important aspect of food sovereignty.

1.2 Food sovereignty in Kenya

A study by World Bank (2013) shows that agriculture is the backbone of the economy in Kenya with 61.1% of Kenyans living in rural areas and engaged in agriculture. This shows that Kenya highly relies on smallholder farmers to produce their food. IPCC (2014, 2007) FAO (2020) Toulimin (2009) and UNDP (2021) also assert that Kenya is largely dependent on output from small-scale rain-fed farming and livestock production. According to Sperling et al. (2008), the challenges to food production in Kenya is affected by the geographical location of the country which is situated in sub-Saharan Africa (SSA). The geographical location of the country means that Kenya is significantly exposed to the increasing effects of climate change and forecasts for increased food insecurity, potentially affecting up to 250 million people by 2020. He continues to argue that because of the food insecurity, giving seed aid specifically, has become a notable feature of the seed systems of many African countries over the decades (ibid). He gives an example of FAO which has implemented 400 seed relief projects in Africa between 2001 and 2003 and parts of eastern Kenya have received seed aid almost continuously since the early 1990s (ibid). Sperling (2008) gives crucial information towards the study on how smallholder farmers in western Kenya are able to determine their own seed systems towards food sovereignty or not. Despite the important study by Sperling (2008), there still is very little information on food sovereignty in Kenya and in particular, western Kenya.

Brownhill (2008) in her study The Struggle for the Gendered Commons: Food Sovereignty in Kenyan Social Movements states that the struggle for food sovereignty in Kenya is for many a struggle to re-invent the commons, to secure land on which to produce food, sustain a family, build community and engage in self-directed livelihoods. She further describes that the Kenyan food sovereignty movement in some regions of the country includes a wide range of actors and peasant farmers organized to oppose neo-liberal trade agendas, impromptu defiance of government regulations by pulling up coffee trees and planting organic food crops (ibid). Through the movement, Brownhill (2008) illustrates that they include groups engaged in rural land occupations, dispossessed urban gardeners and sidewalk food hawkers, slum housing activists, transport workers whose work includes, importantly, the transport of smallholder farmers foodstuffs to markets, and host of others. She concludes by asserting that the struggle for food sovereignty in Kenya unites a range of activists and elaborates a subsistence perspective which: (1) critiques neo-liberal globalization’s capacity to alleviate hunger and malnutrition.; (2) centralizes direct action by farmers, peasants and slum dwellers in local and international social movements; (3) assesses the enhancement of life-centered subsistence alternatives within communities and in connection with counterparts abroad (ibid). Her study is relevant to this research because it highlights the different phases of how food sovereignty is actualized and how smallholder farmers can integrate these aspects while combining African spirituality.

According to Khan et al. (2008) by restoring soils and agro-systems, agro-ecology is also a reliable way to control the outbreak of pests which might be a challenge when employing...
organic food systems towards food sovereignty. For instance, in East Africa the push-pull poly-culture system is very effective for control of Lepidopteran stemborers and it uses other plants in the borders of maize fields, which act as trap crops attracting stemborer colonization away from the maize (the pull) and other plants intercropped with maize that repel the stemborers (the push). Khan et al. (2008) also highlights that participating farmer in Kenya are reporting a 37% to 129% percent increase in maize yield without chemical pesticides. This research is applicable to the study because it shows that SHF can utilize agro-ecological systems for an increased food production without relying heavily on chemicals and pesticides which many not be culturally and spiritually beneficial in food production. Climate smart agriculture is also a useful approach that enhances food production, biodiversity, environmental quality, agroecosystem resilience, livelihoods and economic development while addressing the climate change impacts (Olayide et al., 2016 and Singh and Singh, 2017).

1.3 Major challenges in achieving food sovereignty

Thomson et al. (2011) and Skinner et al. (2006) argue that food sovereignty challenges still exist for indigenous communities today with relatively high food prices. Other challenges facing food sovereignty include industry related contamination of foods, landscape changes and disruption of the environment through deforestation as expounded by Thomson et al. (2011) and MacLachlan (2014). Some of these challenges are going to be highlighted during the present study as observed in Matayos Sub-County, Busia County, Western Kenya and thus the studies of Thomson et al. (2011), Skinner et al. (2006) and MacLachlan (2014) are relevant in establishing the challenges towards achieving food sovereignty. They affirm that the power in food systems needs to be addressed with and by the SHF (ibid). Rudolph & MacLachlan (2013) further elaborate that in general, indigenous communities need to address their food systems. Some of the ways towards addressing the power in food systems is asserted by Morrison (2011) who argued in the People’s Food Policy Project that in linking food production with consumption, and presenting food as sacred, indigenous people are able to address their food sovereignty challenges. Furthermore, Morrison (2011) states that smallholder farmers can establish policy reforms as they address their food systems. All these studies are useful because they map out challenges that smallholder farmers in Matayos sub-County, Busia County, Western Kenya may face in attaining food sovereignty and how they can overcome them.

Consequently, various methods to restrict the utilization of certain natural resources are employed as a way of conserving the environment and continuing the relationship between the African person and their environment which is an ecological perspective and thus lends an ecological angle to this study. The smallholder farmers are part and parcel of their environment even as they practice African spirituality.

Mbti (1969), supports the ecological view by stating that Africans exercise their spirituality in all of their daily activities as he notes that Africans are notoriously religious. Wherever the African is, there is spirituality and he carries it to the fields where he is sowing seeds or harvesting a new crop; he takes it with him to the beer party, or to attend a funeral ceremony; and if he is educated, he takes religion with him to the examination room at school or in the university (ibid). Spirituality deeply permeates society that it is further carried into the political realm where if an African is a politician, he takes it to the House of Parliament where policies are made (ibid). Mbti (1969) is relevant in bringing the ecological angle to the study as well as illuminating how spirituality is present when policies are made concerning the governing and utilization of land as an aspect that brings about the nexus between African spirituality and food sovereignty.

Gumo et al. (2012) continues to set the ecological dimension by saying that humankind, according to African thought and belief, is not an isolated creature. Humanity is only part of the universe which is full of animals, plants and inanimate objects, and is not isolated and all these components are relayed to each other in various ways since they are dependent on the supreme God for their appearance and continued existence (ibid). Gumo et al. (2012) further highlights that African philosophy on resource utilization and environment protection is spiritually based and thus major conservation efforts and control of resources are influenced by spirituality. The African spiritual worldview create respect to nature, reverence of hills, forests, animals and rivers and this practice is still held by some African communities, especially among the Luhya of Kenya who use their spirituality for example to conserve Kakamega Forest (ibid). Gumo et al. (2012) contributes to this study by giving the perspective of ecology as an aspect of food sovereignty and how a SHF integrates African spirituality in their farming systems.

Galli (1973) asserts that among most of our African people, there exist strong beliefs, fears and respect for the spirits of the ancestors. Animals are used for ritual sacrifices to appease the ancestors and deceased spirits who guard the destiny of the living (ibid). The use of animals for spiritual rituals and sacrifices is part of the nexus between African spirituality and food sovereignty. Galli (1973) gives the example of the Nguni of South Africa who sacrifice a goat and consumed it on the arrival of a new baby (ibid), part of an illustration of the nexus of African spirituality and food sovereignty. He highlights that if the ritual goat sacrifice was omitted, the anger and punishment of the ancestors would be apparent by their ‘burning’ the child and the consequent failure of the child to grow and thrive (ibid). To restore equilibrium would then call for elaborate rituals, animal sacrifices and services of traditional practitioners and spiritual elders (ibid). Galli (1973) furthermore shows how African spiritual beliefs concerning food are handed down through the ages and are passed from one generation to another and these beliefs transcend education or social status. Furthermore Shazali et al. (2013) illustrates that the...
beliefs concerning food can occur and be transferred spontaneously without intent thus with little encouragement and motivation from the surrounding, from the known to the unknown as community members get engulfed in the festivities and spiritual practices that accompany the practices. Galli (1973) also offers practical examples of how African spirituality and food sovereignty are intertwined in indigenous societies in Africa and therefore contribute towards practical examples in this present study in Matayos Sub-County.

II. RESEARCH DESIGN

The study was a cross-sectional survey design. This design was chosen because it enabled first hand perception of the experiences of the participants while allowing the use of qualitative techniques of data collection. The cross-sectional survey enabled the researcher to obtain information that described African spirituality in the context of food sovereignty among SHF, by asking individuals about their perceptions, attitudes, behavior and values. Apart from collecting quantitative data, the qualitative data collected during the survey was used for explaining or exploring the existing status among the variables of food sovereignty and African spirituality. The target population for this study was the smallholder farming households in Matayos Sub-County, Busia County, Western Kenya. This Sub-County was selected purposively as majority of the smallholder households produce and process SFC for household consumption and sale.

2.1 Data collection methods, tools and procedures:

A variety of data collection methods were used in order to improve the sampling accuracy. These included self-administered questionnaires, interviews, observations, and focus group discussions (FGD). Data collection tools included an interview schedule, a questionnaire, a voice recorder, an observation checklist and a video camera which allowed for the gathering of comprehensive information. The choice of these methods and tools was guided by the depth of information required to answer the study objectives.

III. RESULTS

3 Characteristics of respondents by education level, marital status and family members

<table>
<thead>
<tr>
<th>Variables</th>
<th>Number of respondents</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>188</td>
<td>47.1</td>
</tr>
<tr>
<td>Female</td>
<td>211</td>
<td>52.9</td>
</tr>
<tr>
<td>Total</td>
<td>399</td>
<td>100</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-25</td>
<td>40</td>
<td>10.0</td>
</tr>
<tr>
<td>26-35</td>
<td>128</td>
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<td>36-45</td>
<td>97</td>
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<tr>
<td>46-55</td>
<td>67</td>
<td>16.8</td>
</tr>
<tr>
<td>56 and Above</td>
<td>67</td>
<td>16.8</td>
</tr>
<tr>
<td>Total</td>
<td>399</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1: Distribution of respondents by demographic characteristics.

Sex: Out of the N=399 who responded to the self-administered questionnaires, a majority of them were female (n=211, 52.9%) and the rest were male respondents (n=188, 47.1%). Of the informants included in the 3 focus groups there were 10 participants each comprised of male (n=10), female (n=10), and mixed gender (male=5; female=5) as well as six case studies of 3 males and 3 females with rich descriptive information in regard to the study objectives.

Age: A majority of the respondents were aged between 26-35 years (32.1%) of the total sample size, whereas those between 36 – 45 were 24.3% and the two least represented groups were those between 46-55 and those above 56, each at 16.8%. The informants in the focus group discussion sessions were all above 18 years of age, while the informants for the case studies were purposefully selected, targeting men and women who had information on African spirituality from past to present between the ages of 67 to 83.

Education level: A majority of the respondents n=242 (60.7%), dropped out of school at Primary level, whereby more females (n=132, 54.5%) than males (n=110, 15%) dropped out. Only n=98 (24.6%) of the respondents had attained Secondary level education, whereby the males (55.1%) were more than females (44.9%), whereas those who had attained post-Secondary education were only n=25, 6.28%, with more males (n=17, 68%), than females (n=8, 32%) having completed education at this level.

Marital status and family members: The total population of respondents who were married were n= 311 (80%) out of which n= 167 (53.7%) were male whereas n= 144 (46.3%) were female. The total population of the single headed families were n= 26 (6.5%). The total population of widowers and widows were n= 62 (15.6%) out of which the majority were females n=50 (80.6%) and the males were n=12 (19.4%). There were more male headed households (56.7% & 50.7%) than female (43.3% and 49.3%) who had family members of the age group between 5-18 years and above 18 years.

Ethnicity and religion: A majority of the respondents were Christians (98%), whereas Muslims and other religions were represented by only 2%. (see Table 1). On the other hand, ethnicity played a major role in the African spirituality and food sovereignty practices the informants in the case studies as well as the FGD’s who were from various clans from the Luhya Ethnic group, while a small number said that they were Luos.
Table 2. Characteristics of respondents by education level, marital status and family members.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Total Population</th>
<th>Males</th>
<th>Females</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td><strong>Education level</strong></td>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Pre-primary</td>
<td>34(8.5%)</td>
<td>7(20.6%)</td>
<td>27(79.4%)</td>
<td>100</td>
</tr>
<tr>
<td>Primary</td>
<td>242(60.6%)</td>
<td>110(45.5%)</td>
<td>132(54.5%)</td>
<td>100</td>
</tr>
<tr>
<td>Secondary</td>
<td>98(24.6%)</td>
<td>54(55.1%)</td>
<td>44(44.9%)</td>
<td>100</td>
</tr>
<tr>
<td>Post-secondary</td>
<td>25(6.28%)</td>
<td>17(68%)</td>
<td>8(32%)</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>399(100%)</td>
<td>188(100%)</td>
<td>211(100%)</td>
<td>100</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Married</td>
<td>311(80%)</td>
<td>167 (53.7%)</td>
<td>144(46.3%)</td>
<td>100</td>
</tr>
<tr>
<td>Single</td>
<td>26(6.5%)</td>
<td>9(34.6%)</td>
<td>17(65.4%)</td>
<td>100</td>
</tr>
<tr>
<td>Widow/er</td>
<td>62(15.6%)</td>
<td>12(19.4%)</td>
<td>50(80.6%)</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>399(100%)</td>
<td>188(100%)</td>
<td>211(100%)</td>
<td>100</td>
</tr>
</tbody>
</table>

**Gender**

<table>
<thead>
<tr>
<th>Age category (%)</th>
<th>Total population</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 5 Years</td>
</tr>
<tr>
<td><strong>Male</strong></td>
<td>54.9</td>
</tr>
<tr>
<td><strong>Female</strong></td>
<td>45.1</td>
</tr>
</tbody>
</table>

3.1 Food sovereignty practices of smallholder farmers

Food sovereignty is achieved when smallholder farmers are able to access culturally appropriate food that is produced through ecologically sound and sustainable methods. Protection of natural resources enhances access to food as expounded in the case studies. The men and women in the FGDs and case studies highlighted that taking care of the environment not only was it an act of African spirituality but that of food sovereignty. The two are intertwined. One cannot separate the smallholder farmer from their spirituality or their food sovereignty. The environment was key in signifying the onset of the planting season and symbolically illustrated that it was time to plant, or weed, or harvest so observing the environment and nature was an integral aspect in food sovereignty of the small holder farmer. The elders observed the rain patterns, the birds, the rivers, the way the sun rose and set, the phase of the moon, the insects and more. Nature had a non-verbal language that it used to communicate with the smallholder farmers about what season they were in and what practices they should embark on. Below is a story from one of the case studies. Before embarking on land preparation, elder members of the clan looked at several factors to help them know that the planting season was almost starting. These factors include the movement of birds, the movement of winds, the levels of water in the river beds and the cloud pattern. In cases where these factors were favorable, the old men would announce to the people to start preparing the land for the planting season. (79-year-old male farmer, Case Study 3)

3.2. Respondents and informants land ownership

Out of the population of N=399 respondents, those who owned more than one acre of land were n210 (52.6%) whereas those who owned less than an acre were n189 (47.4%). (see Table 3). More men (53.3%) than women (46.7%) owned more than one acre of land. During the FGDs with the three different groups, it was evident that smallholder farmers mostly own and farm on small-based plots of land. One informant described land ownership among small holder farmers as follows: "Smallholder farmers have big, and others smaller lands. Some have less than half an acre of land." (Rosemary, 36 years)

Smallholder farmers are also resource poor and therefore unable to acquire large pieces of land and are also often times called peasant farmers. One of the informants mentioned this by saying
"Nowadays there is a land problem where land is scarce and people are more and we do not have money to buy more land since it is very expensive. We are depending on our husband’s land that was inherited from their parents which was passed down to them by their own parents." (Catherine, 56 years)

"Those of us who are widowed have been allowed to maintain the land because we have to take care of the children. Infact those whose husbands died before they got male children are sidelined” (Anyango, 54)

### Table 2: Respondents land ownership

<table>
<thead>
<tr>
<th>Land Acreage</th>
<th>Number of respondents</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than an acre</td>
<td>189</td>
<td>47.4</td>
</tr>
<tr>
<td>More than an acre</td>
<td>210</td>
<td>52.6</td>
</tr>
<tr>
<td>Total</td>
<td>399</td>
<td>100</td>
</tr>
<tr>
<td>By Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>76</td>
<td>40.2</td>
</tr>
<tr>
<td>Females</td>
<td>113</td>
<td>59.8</td>
</tr>
<tr>
<td>Total</td>
<td>189</td>
<td>100</td>
</tr>
<tr>
<td>More than 1 acre</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>112</td>
<td>53.3</td>
</tr>
<tr>
<td>Females</td>
<td>98</td>
<td>46.7</td>
</tr>
<tr>
<td>Total</td>
<td>210</td>
<td>100</td>
</tr>
</tbody>
</table>

N=399

3.3 Land acquisition through inheritance

During the all-male FGD interview, the men expressed that one of the factors that contribute to the dwindling acreage of land for small holder farmers is acquisition through inheritance as quoted below.

"Land size has reduced for most households because of inheritance which causes divisions of the land into smaller pieces.” (Caroline, 34 years)

Furthermore, there are certain spiritual beliefs that governed the division of land among different ethnicities in Matayos Sub-County. These beliefs can be categorized as gendered beliefs, chronological beliefs and spiritual custodian beliefs. In gendered beliefs the FGD interviews highlighted how some ethnicities only recognize inheritance of land through the patriarchal line as quoted below from a male farmer below.

"The Samia ethnic group in Matayos sub county only recognizes the males in the family as eligible to inherit land from their fathers.” (Chrispinus, 27 years)

Not only was your position at birth in relation to your siblings a factor in chronological beliefs affecting land ownership, but also age was an important factor that contributed to ownership of land among small holder farmers as discussed in the FGD. During the FGDs it was discussed that inheriting land when someone was young was problematic and that is why it was mostly older people who inherited land or your clan would inherit land in your stead until you attained a legal age to own the land. Below is a quote from a female farmer.

"You cannot inherit land if you are young.” (Wilkister, 33 years)

Finally land custody was also affected by spiritual beliefs that governed how land was to be managed. The main belief as discussed in the FGD was that ancestral land was not to be sold but only divided within the clan. One could not just go behind the back of the clan and sell the land because a whole ritual needed to be done before one was given approval. The ritual of dividing land among the clan also had a protocol involving inviting the spiritual clan elders to start the process of division as quoted below from a male farmer in the all-male FGD interview.

"Land remains in the clan. During land division, one invites the clansmen (Omwami) for a party to divide the land in acres and according to the children.” (Vincent, 37 years)

In some cases process of land division brought about issues related to sustainable farming because not all land was suitable for smallholder farming according to the FGD interviews. Below is a quote from a male farmer.

"Land division brings issues with the eldest staying furthest while the youngest stays nearest the head of the household’s home. Unfortunately, one does not always get the best piece of land for small scale farming because some inherited land is rocky and not for ploughing, yet you cannot do anything about it if that is the piece of land that you are given. Sometimes parents divide the land according to their own preferences and not so much what you desire as the one inheriting so you have to make do with what you receive. Inherited land can also be sold but it has limitations. You cannot sell inherited land that has burial sites. This land has to remain as ancestral land and you can only till on it.” (Peter, 52 years)

Another issue in land acquisition that is gendered and affected women mostly is the case where the husband and wife are smallholder farmers but do not have any children as quoted below from the all-female FGD interview.

"If a father has no children it brings issues in inheritance. Often times the in-laws disturb the widows. Nonetheless, if women who are widowed or without children have land problems, they go to the government offices for help. To avoid problems of inheritance when a living father is still alive, it is best that he divides the land early and he remains with a piece of land his own use and for his wife.” (Elizabeth, 53 years)

In conclusion, inheriting land for smallholder farming was not all about its disadvantages. One major advantage of inheriting land as highlighted in the FGD interview is quoted below.

"Inherited land is good because you can do what you want with it after inheriting it.” (David, 46 years)

3.4 Land acquisition through buying

Smallholder farmers are able to acquire land through buying which comes with its advantages and disadvantages. During the FGD it was highlighted that some of the disadvantages involved the quality of land as expressed in the quote below from a female farmer.

"Bought land is many times overused because some people sell land after they have eroded and exhausted its fertility. Sometimes buying land is also constrained by finances because you can only buy a piece of land according to how much money
you have so you can never buy as much as you may desire.” (Faith, 25 years)

The main advantage of buying land for small holder farming had a spiritual angle to it as discussed in the FGD interviews and quoted below from a male farmer. “Bought land can be best because you have no ancestral ties and restrictions to it so you can do whatever you want with it.” (Mourice, 57 years)

3.5 Land acquisition through renting

Small holder farmers are also able to acquire land for farming by renting pieces of land either seasonally or annually. Renting also comes with its benefits as discussed in the FGD interviews. Here is a quote from a male farmer. “Renting has profits because you can put your hard work in it compared inherited land which comes with many restrictions. Furthermore, a piece of land that is rented can be more profitable because you have to work to get results unlike inherited land where you always feel like it will be there. All farms are equal but what matters is the hard work that you put on it. You can also rent land which has access to land thus have more control on how you utilize your small farms produce.” (Mark, 31 years)

3.6 Food sovereignty during land preparation

Smallholder farmers are defined as a category of farmers who basically utilize family labor and little or no mechanization (FAO, 2020), when they are preparing their land for the planting season and all through the staple food crop value chain. An exploration of the tools used in land preparation during the FGD interviews and discussion illustrated that tools used for land preparation included the jembe (Hoe). The jembes were highly coveted and kept clean and safe so that they did not get stolen or lost, usually on top of the house on a flat roof or in the rafters so that it didn’t get misplaced. The FGD discussion also elaborated that keeping tools away from the reach of children was a safety precaution that was achieved by placing the jembes on top of the roof.

Smallholder farmers are still marginalized in Matatios Sub-County and do not have access to highly mechanized ploughing tools, still in agreement with FAO, (2020), who describe small holder farmers as marginal with less than two acres of farmland. Some households still use the traditional plough especially those who had larger pieces of land of around 2 acres. The traditional plough is an upgrade from trees and twigs which were initially used to prepare the land. The ox-drawn ploughs were used as a source of income and moved from one homestead to the other under the protection of the household head or their older sons who were of age to direct the plough and the oxen during the land preparation stage. Activities in the indigenous system that persist include the use of hoe digging. It was noted that traditional tilling is held in the spiritual realm and the tools and the use of ox-drawn ploughs in land preparation are highly guarded and protected by each household. Other tools highlighted in the case studies included the mallot, the spade, slasher, long sticks, fire and an iron cutting plate. Those who used mechanized agriculture were very few since the land has been fragmented over time due to expanded families and land inheritance being highly observed. Below are two accounts from the case studies.

The Abhakayo mainly use the traditional plough because it provides favorable conditions for the seed placement and plant growth. In ancestral times they ploughed using a twig of a tree or a crooked twig. Khayo also used a mallot or a spade which has a handle and iron cutting plate. (73-year old male farmer, Case Study 1)

During land preparation, tools like slasher (Luvero), A long stick to support slashing (Shiholo), a hoe (Imbako), and fire (Mullilo) were used simultaneously. (82-year-old-female farmer, Case Study 2)

Livestock like cows were coveted in smallholder farming households in Matatios Sub-County because they could be used to drive the plough during land preparation. Access to livestock was a food sovereignty practice as discussed in the FGD interviews. There are also some farmers who organized themselves in clan level and hired a tractor for ploughing the land, while others hired hand labor for the land preparation. Some believed that using a plough could bring pests and diseases so either used the hand labor or tractors. Below is a quote from a female farmer.

“Cows are used for ploughing and some farmers also use a tractor. Some people do not plough with cows because they spread the striga weed which affects their crops.” (Pamela, 42 years)

The majority of African farmers still use some traditional tools, and have them repaired by village blacksmiths whenever they breakdown. The Cows used for ploughing are also revered and well taken care of. The belief system and attitudes are developed from time to time depending on past experiences such as the striga weed consequence cited by one of the FGD participant. Modernization of agriculture has brought about the use of tractors which very few small holders are able to afford.

3.7 Food Sovereignty During Planting

Staple food crops cultivated by respondents

The cereal crops that were cultivated by the respondents included maize (94.7%) which was practiced by the majority whereas only 33.3% and 6.8% of them cultivated sorghum and millet respectively. Legumes were also grown by the respondents and these included beans by the majority (87.7%), and cowpeas which were grown by only 15 %. Sweet potato and banana farming was practiced by 49.1% and 22.1% respondents respectively whereas fruits and vegetables were grown by 14.5% and 58.9% of the respondents respectively (see Fig 1).

During the FGD interviews, the men and the women mentioned the different types of staple food crops that they grew which included roots, tubers, legumes, fruits, herbs, and cereals. The variety of staple food crops ensured that the households had access to sufficient food and that food was available at all times in levels suitable for consumption. Below is a quote from one of the female farmers.

“Crops that we plant include sweet potatoes, cassava, arrow roots, sorghum, millet, maize, soya, groundnuts, simsim, Mfenesi’, passion fruit, avocado, mango, pawpaw, watermelon, oranges, bananas, sunflower seeds for oil and for selling, ‘Sukuma wiki’, ‘managu’ and ‘mukombo’.” (Devilline, 34 years)
Smallholder farmers (SHF) in Matayos Sub-County generally use broadcasting by hand as a method of planting as illustrated in the case study. The reasons for broadcasting were varied but the main one was that when the plants compete, one would be able to get good harvest when one plants more crops than few. The SHFs were interested in quantity and not quality of the harvest. The farmers chose seeds from the best grain crops from the previous harvest. The seeds were usually dusted with ashes from burnt animal wastes for consumption, although some farmers dried the chosen seed cobs by hanging over the fire place.

There was a definite farming pattern and this followed a regular calendar where the farmers knew that January was the digging period, February the planting period, April to May the weeding period and July to August as the harvesting period for the long season. The planting season was identified by the nature of the clouds and winds and also by the movement of the birds. However, the fall of the first rains was the confirmation of the onset of the planting season. There were some staple food crops (SFC) that were mainly for the short rains season and those for the long rains according to the FGDs. Some of the men and the women also listed some of the ways that they fertilized their farms for planting by mainly using organic manure from chicken and cows which was mixed with the soil before the rains to fertilize the crops. Most of the respondents were not financially able to buy inorganic fertilizers to supplement the harvested manure and thus the low crop yield However, they still practiced organic agriculture and believed in the fact that it kept their ancestral rich heritage of traditional knowledge and traditional agricultural varieties which are transmitted through farmyard manure, animal manure from cows and chicken waste and therefore automatically recycling the resources for continuity and sustainability of seed and crop diversity. Taken together, these traditional practices create an ecological balance, which ensures rational use of animals and plants for food and other purposes. They guide the philosophy of resource utilization, conservation, thus environmental protection and food sovereignty in the food system as people work towards owning their own right to food. A place, practice or a natural phenomenon is declared sacred and worth practicing for sustainability.

This is a worldwide practice, where rural farmers continue the food sovereignty practices as passed down by their elders and continue to be recognized as the custodians of natural resources including biodiversity (Chhatre and Agrawal 2008, Gumo, 2012). In this study, it is noted that the farmers continued to preserve the best seed genotypes through unique and valuable traits within their herds and traditional crop varieties that tolerate environmental stresses including climate change (Boyce 2006; Gonzalez 2010, 2011; Johns et al. 2013). High vegetational diversity and a multifaceted system of indigenous knowledge are the salient features of traditional farming systems and food sovereignty in developing countries (Altiere, 1993; Gliessman1998). Due to the low yield of SFC experienced, it was noted that traditional practices coupled with modern sustainable farming practices would be a noble choice for climate change mitigation and adaptation leading to a sustainable food system and hence food security for the smallholder farm households as also noted in the study by Singh, Singh, (2017). Below are some accounts from the case studies on the types of crops grown by SHF in Matayos Sub-County.

My community mainly plants cassava, millet, sorghum, maize, beans, sweet potatoes, banana, vegetables like sucha and chimboko. (73-year-old male farmer, Case Study 1).

We plant crops such as Sorghum (Kamaembba), Finger Millet (Vulo), Maize (Nasima) as well as vegetables like Chisaka, Namasaka, Murere, Murende, Liseveve (Kamaondo) (79-year-old male farmer, Case Study 2).

We plant several crops like Maize (Matuma), Finger Millet (Vule), Sorghum (Mavele) and vegetables – cowpeas (Likhuvi), Tsisaka, Nderema and pumpkin (Mahondo) (82-year-old female farmer, Case Study 3).

During short rains we plant crops like Maize, Soy Beans, Sweet Potatoes, Beans and vegetables like Sukuma Wiki, Kunde and Suya. During Long rains we plant Sorghum (Wimbi) and Millet (Mmana). I also plant cotton as a cash crop. (67-year-old male farmer, Case Study 4).

. Crops planted are mainly cereals such as Hard Nuts (Tsimbande), Simsim (Tsinnui), Sorghum (Maveria) and Finger Millet (Vule). Crops like finger millets (Ovule), Sorghum (Amavele) and

![Figure 1: Staple food crops grown by respondents](image-url)
many vegetables are planted by broadcasting (Okhumitsa). (79, year-old male farmer, Case Study 3).

### 3.8 Tools used through the staple food crop value chain

Tools are an important aspect of food sovereignty for SHF since one of the ways SHF are defined is by their utility of little or no mechanization. In the case studies it was highlighted that some of the tools used were traditional and made from locally available material from trees and rocks. Below is a story from one of the case studies.

The traditional farmers used the traditional methods for how food was planted, weeded, harvested, processed, and prepared as follows: We prepare the farm using a traditional tool which is made of wood and is called “Omwolo” to slash and clear the bushes. We also use the acacia wood as a tool and it is shaped in different sizes and shapes. For weeding we use a tool to remove deep rooted weeds like “Olumbuku”. We also have a traditional spade for ridges and furrows especially for those who were in the lower lands. The handle of this spade is made of Acacia wood which is strong and head of the spade is made of iron. During harvesting, crops like millet, cereals and pulses are harvested using a sickle which is designed in a C shape and is called “Lukairo”. We also used a knife called “Likhandu” which is made of iron for crops like sorghum. The Abaluhya believed in using certain tools for different stages of food production would bring them success in their farming. (73 year old farmer case study 1)

### 3.9 Food sovereignty during harvesting

The harvest stage in the SFC value chain was the culmination of a communal effort of controlling the production of food among small holder farmers in Matayos Sub-County. It was a spiritual time full of celebrations and rituals. The tools used to harvest the crops so that they could be distributed to the spiritual centers, to the needy and stored up for the household were carefully selected to encourage ease of work. During the case studies, some of the tools revealed were still hand held and primitive and were used as a common practice as passed down by the ancestors in comparison to highly technological and mechanized tools but they were able to accomplish the work of harvesting SFC from a small acreage of land and this helped them to keep busy and guard and monitor the harvest as they worked. Below is a narration from one of the case studies concerning the tools used for harvesting.

For harvesting the Khayo mostly use a small sickle (Lukharo), a big sickle (Lukharo Lukongo), Knives (Likhande) and an axe (shoka). On post harvesting the Khayo used the following tools:

1. A wooden stick (Muswajiru) which is made of bamboo and is used to remove the covering of the maize cob.
2. A bamboo basket (Shihinda) for carrying farm products.
3. A pestle and mortar (Shinu na Muswaiju) for grinding groundnuts and simsim into paste.
4. A hand mill for grinding cereals and pulses.
5. The winnower (Luderu) for separating the grain from the husk.
6. A sieve (Shijunji) which is used for separating the different types of grain.
7. A sack for storing farm products. The traditional sack is made up of the skin from sheep and sometimes cow skin.
8. A store house (Shiachi) for storing grain.
9. A wooden container (Shiiny) for processing sesame seeds and groudnuts.

<table>
<thead>
<tr>
<th>Processing tools</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Plate 1: Muhuni and Mwikho for Processing Harvested Maize and Sorghum Respectively. Source: Researcher (2020)." /></td>
</tr>
</tbody>
</table>

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During the FGDs the men and women discussed how storage and harvesting go hand in hand because what is collected from the farms has to be selected and stored appropriately so as to feed the household for longevity. There are different types of storage either made from naturally available material of plants and trees or from animals. Below is a quote from a female farmer in the FGD interviews.

“Mostly food is stored in gunny bags. Sometime stores called Shiachi or Abundu are made before the harvest of crops. We store some food and some first fruits we give to the church and extra food we share with the needy. During the harvest exercise we eat the first eggs of the chicken to have energy for the harvesting work which is usually tedious.” (Elizabeth, 32 years)

The respondents from Matayos believed in storing food for their food security even though the harvest was meager. They were proud of the little that God enabled them to harvest and they preserved it with keen interest and responsibility using both traditional and modern methods. The use of ash from barks and leaves of trees believed to have preservation and medicinal values were identified by the elders for grain preservation, was an inherited food sovereignty practice, that they sprinkled over grain and spread it comprehensively in a shihinda before storage in lidded earthenware pots, or woven baskets or sometimes gunny bags. The seeds that were preserved for future planting were preserved separately, well covered with ash and stored in sand in an earthenware pot. All these methods kept the grains dry enough for long and kept the families food secure. These practices are also noted in Awuor (2011) study among the Luo of Nyanza, Kenya.

3.10 Food sovereignty during seed and food preservation

SHFs in Matayos Sub-County illustrated how they are able to control how they prepare themselves for upcoming planting seasons in the preservation of the seeds and in some cases in the preparation to buy seeds that are acknowledged and permitted by the GOK. During the FGD interviews, the ways in which seeds are preserved was discussed exhaustively. Below is a quote from a male farmer on how they preserve their seeds.

“Some people preserve seed from former harvest while others buy the seed for the next harvest. For those who preserve their seeds, the seed is hung in the kitchen for cereals crops like maize, sorghum, and millet. Sometimes one would also put the seeds in a calabash that was a special basket for seeds and kept within until the next planting season. These calabashes were first dried by putting some ash within it. Even those people still use this traditional method to preserve their seed, there is also an option of using chemicals to keep the seeds. However, there is a belief that these chemicals bring disease. Usually when one is sorting out seeds for the next harvest, the type of seeds would determine how it is preserved. For me I cut my sorghum and hung it up in the kitchen to dry while for my maize I take it when it is not shelled and throw it on the roof to dry for the next season.” (Henry, 48 years)

Smallholder farmers provide most of the food available in the community and thus sustainability is an important aspect in their farming systems. According to the case studies, practices utilized for preservation of food was embedded in the belief system of the farming households. If they believed that traditional stores were good for storage, that is what they would use. If they believed that smoke prevented meat from rotting and kept fresh for a week, that is what they would use. If they believed that ash could act as a
pesticide, they would include it in the food sovereignty practice during the storage stage. Below is a narration from one of the case studies.

The Abaluhya preserved their food depending on what they believe in for example the “Siaki” are traditional stores which are used for safe keeping of food in the community. The Abaluhya also use smoke to preserve their food. They put their crops on the rafters of their traditional huts, over a three stone fire. The smoke prevents insects from destroying the cereals and food. African traditional rituals for food preservation also includes the belief that adding ash to planting seeds can preserve them for one year without them being damaged by pests. (73-year-old male farmer, Case Study 1)

<table>
<thead>
<tr>
<th>Drying, storage &amp; processing</th>
<th></th>
</tr>
</thead>
</table>

3.11: Food sovereignty in food preparation

Food preparation among SHF in Matayos Sub-County is culturally appropriate as elaborated in the case studies. The tools used are what is readily available. There are ways in which the harvested crop was made suitable for cooking that was particular to the different communities represented in the county. The pulses and cereals were sorted for cooking as described in the story below from one of the case studies.
In the processing of food, we mostly use a stone roller for threshing of pulses and cereals. Threshing with a stone roller is fast and effective. A pulse sieve called ‘Sichungo’ is mostly used for separating the full grain from the split grain. It also removes stones and other wastes and is made with iron.

<table>
<thead>
<tr>
<th>Food preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Plate 13: Couple Preparing a Meal of Potatoes in their Homestead. Source: Researcher (2018)." /></td>
</tr>
<tr>
<td><img src="image2" alt="Plate 14: Young Girls Preparing a Meal of Traditional Vegetables in their Homestead. Source: Researcher (2018)." /></td>
</tr>
</tbody>
</table>

3.12 Food security in smallholder farming households

The respondents were asked to state how often they experienced food insecurity in the past one year using nine questions that would determine their food security status so as to determine if their food sovereignty and African spirituality impacted their food security. Household food insecurity status was measured using FANTA HFIAS tool which consists of nine occurrence questions that represent a generally increasing level of severity of food insecurity (access) and nine “frequency-of-occurrence” questions that are asked as a follow-up to each occurrence question to determine how often the condition occurred one year preceding the survey.

Food secure households did not worry about food access; they rarely experienced anxiety about not having enough food. These are households that were able to have a full meal three times a day without food running out, in the past 30 days. The mildly food insecure households were anxious about not having sufficient food, they usually consumed inadequate diet, or ate food that they did not prefer. However, these households did not experience the three severe conditions of going a whole day without eating, going to bed hungry or running out of food in the last 30 days. Moderately food insecure households began sacrificing quality on a continuous basis by consuming inadequate diet and eating less preferred food. They started reducing the quality of food intake by decreasing meal sizes and by only eating once or twice a day in the past 30 days. Severe food insecure households experienced high incidences of food insecurity. The condition of reducing meal sizes and the number of meals worsened each day. The three most severe conditions of going a whole day without eating, going to bed hungry or running out of food in the past 30 days occurred ‘often’. Furthermore, households that experienced the three most severe conditions only once or twice in the past 30 days, were also considered as severely food insecure households (Coates et al., 2007).

People experiencing moderate food insecurity face uncertainties about their ability to obtain food and have been forced to reduce, at times during the year, the quality and/or quantity of food they consume due to lack of money or other resources. It thus refers to a lack of consistent access to food, which diminishes dietary quality, disrupts normal eating patterns, and can have negative consequences for nutrition, health and well-being. People facing severe food insecurity, on the other hand, have likely run out of food, experienced hunger and, at the most extreme, gone for days without eating, putting their health and well-being at grave risk.

The respondents were asked whether they worry about food and n=199 (49.9%) indicated that they were not worried, whereas n=190 (47.6%) indicated they were able to eat preferred foods. The study also established that only n=51 (12.8%) of the respondents ate a good variety of foods whereas the rest only enjoyed diversity of food eaten inconsistently due to lack of resources.

The study tried to establish if the respondents had to eat some food that they really did not want because of lack of resources and n=197 (49.3%) some of the respondents did not experience an instance where they had to be content with smaller meals (22.6%), fewer meals (35.1%) or no food at all (48.6%). (See Table 4).

On whether or not any member of the household slept at night without food or went all day without food n=197 (49.3%) and n=198 (49.6%) respondents said that they never slept at night without food or went whole day and whole night without food. Those who rarely slept without food or rarely went 24 hours without food were n=99 (24.8%) and n=101 (25.3%) respectively. Finally, those who sometimes slept at night or went whole day and whole night without food were n=103 (25.8%) and n=100 (25.1%) respectively.

An average of the category of food insecurity which would render a household to be food insecure to some degree was taken, where by the respondents that indicated as having experienced food insecurity often, sometimes and rarely were averaged to determine those who were negatively impacted with accessing food due to limited resources sometimes and always. It is noted in Table 4.3 that an average of n=106 (26.5%) of the respondents reported to have worried about food shortage during the last one year; whereas n=109 (27.3%) reported inability to eat the preferred food; 251 (62.9%) reported to have eaten limited variety of food; n=105 (26.4%) ate food that they really do not want to eat and were unable to eat the preferred variety of food due to lack of adequate resources;
n=210(52.6%) reported that their household members had eaten smaller amount of food; 165(41.4%) missed the number of meals per day; n=105(26.4%) reported that they had no food of any kind to eat; n=103(25.9%) reported sleeping without eating food; and n=100(26.5%) reported to have spent the day and night without eating any food.

**Table 4: Respondents’ household food security status**

<table>
<thead>
<tr>
<th>Food security variables</th>
<th>No</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Often</th>
<th>Sometimes, &amp; often</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Worry about food</td>
<td>199(49.9%)</td>
<td>94(23.6%)</td>
<td>66(16.5%)</td>
<td>40(10%)</td>
<td>106(26.5%)</td>
</tr>
<tr>
<td>2 Unable to eat preferred foods</td>
<td>190(47.6%)</td>
<td>100(25.1%)</td>
<td>79(19.8%)</td>
<td>30(7.5%)</td>
<td>109(27.3%)</td>
</tr>
<tr>
<td>3 Eat just a few kinds of foods</td>
<td>51(12.8%)</td>
<td>97(24.3%)</td>
<td>101(25.3%)</td>
<td>150(37.6%)</td>
<td>251(62.9%)</td>
</tr>
<tr>
<td>4 Eat foods they really do not want to eat</td>
<td>197(49.3%)</td>
<td>97(24.3%)</td>
<td>70(17.5%)</td>
<td>35(8.9%)</td>
<td>105(26.4%)</td>
</tr>
<tr>
<td>5 Eat smaller meals</td>
<td>90(22.6%)</td>
<td>99(24.8%)</td>
<td>104(26.1%)</td>
<td>106(26.5%)</td>
<td>210(52.6%)</td>
</tr>
<tr>
<td>6 Eat fewer meals in a day</td>
<td>140(35.1%)</td>
<td>94(23.6%)</td>
<td>110(27.5%)</td>
<td>55(13.8%)</td>
<td>165(41.4%)</td>
</tr>
<tr>
<td>7 No food of any kind in the household</td>
<td>194(48.6%)</td>
<td>100(25.1%)</td>
<td>70(17.5%)</td>
<td>35(8.9%)</td>
<td>105(26.4%)</td>
</tr>
<tr>
<td>8 Go to sleep hungry</td>
<td>197(49.3%)</td>
<td>99(24.8%)</td>
<td>103(25.9%)</td>
<td>-</td>
<td>103(25.1%)</td>
</tr>
<tr>
<td>9 Go a whole day and night without eating</td>
<td>98(49.6%)</td>
<td>101(25.3%)</td>
<td>100(25.1%)</td>
<td>-</td>
<td>100(25.1%)</td>
</tr>
<tr>
<td>Average</td>
<td>162(40.6%)</td>
<td>109(27.3%)</td>
<td>82(20.6%)</td>
<td>46(11.5%)</td>
<td>150(37.6%)</td>
</tr>
</tbody>
</table>

N=399

From the total respondent households, it was noted that n=150(37.6%) experienced some degree of food insecurity in the one year preceding the survey despite their food sovereignty practices and African spirituality. Among these households n=109 (27.3%) were mildly food insecure, n=82(20.6%) were moderately food insecure, and n=46 (11.5%) were severely food insecure. (See Table 5).

**Table 5: Respondents food insecurity status.**

<table>
<thead>
<tr>
<th>Respondents food insecurity status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food Secure</td>
<td>162</td>
<td>40.6</td>
</tr>
<tr>
<td>Mildy food insecure</td>
<td>109</td>
<td>27.3</td>
</tr>
<tr>
<td>Moderately food insecure</td>
<td>82</td>
<td>20.6</td>
</tr>
<tr>
<td>Severely food insecure</td>
<td>46</td>
<td>11.5</td>
</tr>
<tr>
<td>Total</td>
<td>399</td>
<td>100.0</td>
</tr>
<tr>
<td>Average food insecurity</td>
<td>150</td>
<td>37.6</td>
</tr>
</tbody>
</table>

N=399

During the FGDs it was discussed that in an African set up it is always expected that each household ought to have some food to eat after going through the process of planting and harvesting their crop while observing African spirituality. Therefore, they would rather never utter that the food they harvested was not enough otherwise the gods would not give them favor in any way for not having worked hard enough.

In 2022, Kenya recorded has recorded estimated 3.4 million faced with starvation due to prolonged drought and erratic rains with populations in Semi-arid and arid counties bearing the brunt (USAID, 2022). The Sustainable Development Goals (SDG
Seed preparation and selection is the crux of the nexus between African spirituality and food sovereignty and it is demonstrated by how farmers select their seeds for each planting season, further emphasizing Shiva (2021) who highlights that the seed is the source of life and of food and that to protect food freedom, one must protect seed freedom especially in how one selects seed for the planting season. In this study, it is evident that being custodians of the culture and traditions in African spirituality through the SFC value chain, elders passed on the need to care for the environment to the younger generation through emphasis on hard work and the care for water, soil, trees, and other forms of vegetation, which are used for different purposes as alluded to earlier, especially through initiation ceremonies and day-to-day activities and food utilization by households and food festivals. Elderly women taught the growing girl child whereas elderly men taught the boys all the activities related to conservation of resources required for a good harvest of SFC and they were the watchdogs of the good practices so that anyone who did not adhere to good practices would be punished. This finding is in agreement with the study done in Zambia by Mwale & Chita (2015). Most importantly, in this study, it was also noted that traditional understanding that misfortunes of all kinds including poor harvest, and droughts were as a result of witchcraft, adultery, angering the gods and other social ills was still prevalent in the study area and was echoed by both genders, and would affect food sovereignty and food security negatively in concert with Mwale & Chita (2015) study. Important to note is that taboos, religious beliefs, and sacred rites provide a framework for defining acceptable resource use and that their base is linked to the spiritual world that streamlines these practices, which is in agreement with Gumo et al (2012). Train up a child in the way he should go: and when he is old, he will not depart from it (Proverbs 22:6, KJV), and in this context, the same training on good practices will be passed on from generation to generation. Most importantly, taken together, these interrelated practices create an ecological balance, which ensures rational use of animals and plants for food and other purposes. They guide the philosophy of resource utilization, conservation, and environmental (Kauffmann, 2000).

Food Sovereignty is a relatively new concept which despite very little advocacy, is something that is embodied to some extent by SHFs. More and more younger people are going back to working on the land and they have the right to define their agricultural systems in ecologically sound ways. It is the constitutional right for every SHF to produce culturally appropriate food produced through sustainable methods and to utilize their spirituality to achieve this. There needs to be more sensitization on food sovereignty through the Busia County Agricultural Officers and other non-governmental stakeholders. This approach should be replicated throughout the nation since a climate resilient food system requires local cooperation, knowledge co-production, collective action and the creation of a shared vision of what a socially just and sustainable food system looks like (Drimie & Eichinger, 2022). Advocacy targeting the youth and women while not leaving out the men will ensure that strategies are set out to integrate food sovereignty practices that are sustainable.

There is a need for the government in conjunction with the spiritual and religious centers to institute capacity building programs through workshops to help SHFs to venture into agribusiness and other ways to increase their livelihoods so that they can in turn improve their food sovereignty status. There need for integrating and including African spirituality and food sovereignty practices and the guiding principles in the Kenya national food and nutrition security policy cannot be ignored. Such a policy should state that before any development intervention can be approved by the government, it should clearly outline how the two aspects are to be integrated in every small holder farmers’ value chain intervention for a healthier food system environment.

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AUTHORS

First Author – Owino Harriet Nyakecho, Pwani University
Second Author – Mugulavai Violet Kadenyeka, University of Eldoret
Third Author – Tsawe-Munga Chidongo, Pwani University
Fourth Author – Joshua Stephen Muoki, Pwani University

Corresponding author: harriet.scott@gmail.com
Deep Water Communication Using Light Fidelity (Li-Fi)

Sanket Thorat

Dr. Babasaheb Ambedkar Technological University, Maritime Research Centre, Pune

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Abstract- Communication has been a crucial part of present and future upcoming. It is been pushing the today's world by the evolving and never halting momentum of wireless communication systems. Considering the underwater communication as of now there exists no such a reliable and an ideal technology for human interaction. Also, the congestion in the Radio Frequency Spectrum discourages the lookout for such an efficient technology. Also, it is practically next to impossible to create a place for such a set of customers and service providers with the interest in underwater domain. Although this situation seems to be pointing to a tough spot, there's an emerging field that could possibly a favorable and a reliable mode of communication for these needs. Light Fidelity also known as LiFi can be an alternative. LiFi, is a field of wireless communication and transmission of energy waves carrying information optically. Also, for a case, it can be a replacement for Wireless Fidelity (WiFi) as LiFi being a higher intensity wave transmission is capable of providing higher rate, capacity to utilize its bandwidth to the fullest and the covers more bandwidth spectrum than that of Radio Frequency. This literature survey will try to explore the different aspects of the Li-Fi based underwater communication system, by exploring the recent study regarding same and will also mention a probable system for a Li-Fi based communication that could be practically achievable with consideration of the capabilities to handle multiple users for a unit coverage area.

Index Terms- Light Fidelity (Li-Fi), Deep water Communication, Visible Light Communications (VLC), Wireless Fidelity (Wi-Fi).

I. INTRODUCTION

Light Fidelity (Li-Fi) is the upcoming exemplar of revolution one of the usual human behaviors in attempting to explore the higher frequency bandwidths, [2] in the field of bounded wireless communication. The hypothesis that can be claimed as a basis for this technology led to a probability that the data can be transmitted with the help of light emitting diodes (LED) with a controlled transmission rate achievable by adapting the light intensity which varies way much faster than the observation capability of an average human eye [1]. For such a system, the light emitted and managed through the LED panel can be a reliable source as well are target for transmission and reception of data simultaneously. The coverage for such a case can be varied by increasing or decreasing the number of diodes that boosts the intensity of energy wave which in hand boost the transmission rates

The Journal of Light wave [1] mentions about the varying behavior of the communication system with the change in the distance between LEDs. Just briefing on some of the concerned research and studies I have tried to put this note in a way that covers What exactly Light Fidelity can be interpreted as by going through every necessary building unit for these systems to fulfill the need of setting up a Wireless Communication system. This kind of system can be referred to a nanometer wave communication as the light energy spans the wavelength of 400nm - 700 nm capable of functioning both as a transmitter as well as receiver. Even though the term LiFi comprises of light, it highly differs from Visible Light Communication [2]. Where LiFI tends to be a multiuser system, VLC has applications limited to point-to-point communication. In addition to that LiFi can be a full-fledged networking system. As LEDs play a crucial role in the propagation of energy waves, selection of these LEDs has a considerable impact on the systems efficiency. Attributes like the number of LEDs per unit area, the ability to change the state (i.e., ON/OFF) with a rapid rate. The size of LEDs also impacts the speed by which the data is transmitted.

II. LI-FI BASED UNDERWATER COMMUNICATION SYSTEM OVERVIEW

2.1 TRANSMITTER & RECEIVER

LED Bulbs as mentioned earlier are an ideal and most efficient transmitter being an energy efficient option with less explicit architecture needed. The ideal option for the driving transmitter devices is the incomprehensible solid-state lighting LEDs specifically due to the low-price and high availability in current markets. Because of these component’s unique limitations and capabilities, transmission of cryptic data can only be achieved by the intensity of the light. This is possible by opting for the energy waves that differ in frequency. On a simpler term by opting colored lights. But if we talk about a reliable and efficient technique, only LEDs emitting blue light is essential for such a model. Considering speed, 1 Gbps can be attained using phosphor-coated white LEDs [4] and 3.4 Giga bits per second by the red green-blue (RGB) LEDs [5], the highest speed that can be ever achieved from a single-color incoherent LEDs is 3.5 Giga bits per second as of in air medium. But considering this model data speed
can be kept as a secondary need. A white light emitting diode is to usually made of blue LED with yellow phosphor coating. When a beam of blue light passes through yellow phosphor coating layer it becomes white light. Another option is to be a blend of red, green and blue (RGB) LEDs [3]. With appropriate and measured use of red, green and blue a white can be fabricated. As the light emitted by LEDs are incoherent in nature, there is a necessity of Intensity Modulation (IM). In IM signal, the optical power output of a source is varied in accordance with some characteristic of the modulating signal. This signal is received at a receiver by using Direct Detection (DD) method.[4] Here, a photodiode would be responsible for the conversion of optical energy to a proportional voltage level. As Li-Fi transmission using Avalanche Photo Detector as receiver with Tx wave Intensity Modulation or Direct Detection is a preferred choice when compared to a PIN photodiode LiFi communication model [3].

2.2. MODULATION

Primarily, Li-Fi based systems uses dimming based modulation techniques which are single carrier-based modulation techniques. The necessary data rate for transmission is achieved by On-Off state of the LEDs on the backend monitoring the voltage levels. Pulse Width Modulation, On-off keying, Pulse position modulation, Variable pulse position modulation, optical spatial modulation and Overlapping PPM are the major approaches for dimming based modulation[13].

On the other hand it is possible to transit data at higher data rate by using multicarrier modulation but it leads to more energy loss during transmission which can be a concer as the main problem to tackle in LiFi is the coverage area. Though the preferred approach for such modulation is Orthogonal Frequency Division Multiplexing (OFDM), it has bipolar behavior. So, it demands few changes in the traditional system to implement the OFDM for Light Fidelity with efficiency at its acme. In “OFDM visible light wireless communication based on white LEDs” author proposed an Asymmetrically-Clipped Optical (ACO) OFDM in which odd subcarriers are modulated DC-biased Optical OFDM is a scheme in which all subcarriers are modulated and unipolar signal is generated by adding positive direct current [13] being more energy-efficient when compared to DC-biased Optical OFDM. The overall performance of these OFDM modulation techniques is a affection due to the non-linear relationship between the LEDs and the current supplied to it [13].

The need for the communication and illumination can be achieved by these modulation techniques when combined with the different wavelengths of light energy i.e. multicolor lights. A scheme named Color Shift Keying (CSK) [8] relies on the encoding of color intensities emitted by the RGB LEDs. The constant color is maintained by mapping the transmitting bits in to instantaneous chromatics of LEDs to ensure constant luminous flux. CSK has Reliability on LED performance due to constant luminous flux and has no flicker effect over all frequencies. In “OFDM visible light wireless communication based on white LEDs,”[8] author mentions the Metameric modulation (MM) that is capable of modulating data in the visible spectrum while maintaining a constant lighting state. MM has a better Color quality control and higher energy efficiency. Color intensity modulation (CIM) proposed in [8] provides dimming in color space. CIM also satisfy the need of color matching and increases the data rate in signal space for multicolored LED based system. Considering the Modulation techniques, they can be categorized as:

- Single Carrier Modulation
- Multi - Carrier Modulation
- Li-Fi specific Modulation

HISTORY & STATE OF THE ART:

Basically, the concept of Li-Fi was been proposed in the 1960’s considering theoretical approach but was unable to produce a practical product as of the date technology for artificial light was “Tungsten Filament bulb”. This technology led to a meaningful technology, as the LED was invented and hence technology of LiFi was invented and proposed by Prof. Dr. Harald Hass in TED Global, March 2011. So, the first working prototype of LiFi was made by “Pure LiFi” a university-based Organization by University of Edinburgh. But the prototype was used for the air medium.

DEEP WATER:

The area below 1000 meters of the sea water surface is the area named “Deep water”. This is the area where the Radio Frequency is of no use for any of the technology. So, currently there is no mode of communication underwater so the only option for such a technology is communication through Light waves but in order to achieve a point to multipoint or multipoint to point communication using Light Fidelity. Currently Visible light communication systems are in existence but such systems limit to point to point communications.
PROBABLE SYSTEM:

So, the above system provides an underwater communication system. Both the user uses duplexer as it is needed to communicate and receive data at both the sides. The arms have amplifier and led driving circuit each for modulation and receiving purpose respectively.

So, for a case the sound signal from use is transmitter through duplexer to decide the condition of transmitting or receiving. On the basis of selection, the data is further transmitted to:

- **LED driving Circuit:**
  This device does convert the sound data to digital data i.e., logical 1’s and logical 0’s according to the base of intensity of light which is directly based on the electrical signal produced by the sound waves.

- **Trans impedance Amplifier:**
  This is the case for transmission, here the data is modulated in order to prevent data loss during transmission and then passed to LED. The led glows on the basis of parameter considered for modulation providing a logic 1 or logic 0 digitally.

Following is the data conversion i.e., sound to digital data conversion

CELL NETWORKING:

ATTOCELL NETWORKING:

Basically, Cell relates to a term related division of an area under substations named Base Station (BS). Generally, the Cell for mobile communications is a Hexagonal Cell Network. But for LiFi Communications the Cell networking used is called Atto Cell.
Networking. So, this Cell Networking is used for the simple handover strategies.

Handover is the technique used for the user when crossing a cell to another and hence is needed to be registered on the moving cell. So, Atto cell has a round coverage with decreasing luminous intensity as we go far from center of source and its usual case for interference. So, Router comes into work here by continuously monitoring the intensity value of an average transmission. So, during interference the user gets registered under the server providing high value intensity or above threshold value.

CHALLENGES IN DATA TRANSMISSION:

ARCHITECTURE REQUIRED:

According to [12] there exists total number of 0.337 millions of antennas used for communication and as the Radio Frequency is highly congested. So, 0.337 millions of antennas utilize complete RF so multiplying by 10,000 (as the visible light obtained is 3.37 billion which is very much low as of the global production till a new LED working gets useless. So, the major architecture needed for this system to accept globally is in our surroundings just there is a need of chip consisting of transmitter & receiver.
III. CONCLUSION

A scenario based LiFi system design is achievable with unit coverage area measured as cells. We can control the coverage area by considering cell size, cell shape, and light intensities. We have also presented an overview of LiFi based underwater communication system. LiFi based system can potentially be a more efficient substitute for RF based communication with an implicit ability to turn every LED in use to be a wireless transmitter and receiver itself promoting the use of LiFi. Though the implementation requires a massive initial investment, the throughput when implemented on a macro or even a wider area network scale has higher probability of compensating it. Considering current limitation of the reach of the transmission waves, LiFi would demand an advance research to overcome this to be on the practical side of its use.

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AUTHORS

First Author – Sanket Thorat, Email: 201603116@dbatu.ac.in, Dr. Babasaheb Ambedkar Technological University, Maritime Research Centre, Pune
Involvement Of Key Stakeholders In Supervision Of Quality Service Delivery In Public Primary Schools In Mandera East Sub County, Kenya

Mohamud Ali Shuria
Mount Kenya University
Department of Social and Development Studies.

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Abstract
This study assessed the involvement of key stakeholders in supervision of quality service delivery in public primary schools in Mandera East Sub County of Mandera County, Kenya. Public institutions for learning are faced with enormous challenges in trying to compete with private institutions in the offering of quality education. Hence there is need of involvement of key stakeholders in supervision of quality service delivery. The specific study objectives include: To find out if parental participation in supervision affects quality service delivery, to assess how teachers’ participation on supervision affect quality service delivery, and to assess the role of the government participation on supervision of quality service delivery in Mandera East sub county. Descriptive research design was used where the target population was 288 respondents: sub county directors 2, Class representatives of PTA 52 and teachers 234. This study adopted the census method to select all the teachers and subcounty directors of education due to the size as well it covers a wide spectrum of the population. The study used Primary data which was collected using a questionnaire. The study also found that government agents performing supervision of quality services should be more pupils centered. The study recommends that stakeholders should take active roles in education matters especially the county elected leaders and others who are in leadership position. Parents and teachers to work together on their children's academics through consultation process and monitoring the child academic journey. The study also recommends that head teachers, quality assurances standards officers should allow teachers to be involved in school supervision and other administrative duties, and school activities. Priority should be given to education for the goal of maximizing the potential of increased effectiveness via results-oriented management and evaluation.

Keywords: involvement, monitoring and evaluation, stakeholders, and supervision, quality service delivery.

Introduction
Monitoring and Evaluation helps different project managers to gather and analyze the progress of project or program, institution. More so it enables the managers to explore underlying challenges, lesson learnt as well as general performance. Monitoring and evaluation systems empower the project manager to judge if the project implementation is on the right truck or not. Monitoring and evaluation is about identify gaps in order to develop tactics that can be applied to improve similar interventions and performance in the future (UNDP, 2009). Supervision is crucial element of monitoring and evaluation systems, in such that the project or program management, head of institution use it as guidelines and micromanage the work of their staff; as well as to control their task performance in such a way that a common goal can be achieved (Pont, Nusche & Moorman, 2008). In a school setting, supervision of teaching and learning activities is used to supervise teaching and non-teaching staff, students, a school building, facility, or staff level.

Globally, child’s talent is valued by ensuring that they get proper and serious education to nurture those talents. In the United States of America (USA), there’s keen interest on peer tutor’s employment by the school managers and administrators in order to enforce instructional supervisory roles. The supervision, tradition continued revolution in America through the middle of the 19th century. Though the emergency of new America system, the quality of education has not improved quiet well (Usman, 2015).
In Australia, the quality teacher programme (QTP) was put in place so as to enhance status of teaching in the Australian government schools and, also upgrade and improve teacher’s skills and understanding in each of the primary taught subjects. Nonetheless, on the other hand, in Chile, the purpose of teacher monitoring and evaluation system was to enhancing teaching and consequently also in the education results. The principals do their own evaluation on the teacher’s performance while the teachers assess themselves in form of syllabus coverage and assignment marking (Piper, 2007).

In Africa, education system is faced with great challenges that cause them to perform poorly in the sector. In sub-Saharan Africa for example, there are setbacks when it comes to infrastructure that is supposed to provide teachers and others key stakeholders in the involvement of school’s supervision. In Nigeria, The Federal Republic of Nigeria (2013), categorized supervision as a phase of school administration which tends to ensure continuous evaluation and monitoring and improvement of teaching and other educational services by different stakeholders. In Tanzania, monitoring and evaluation of school curriculum implementation of set policies is a vital exercise of ensuring delivery of quality education, adherence to set policy laws and regulations. (URT,2000). According to Heyneman's (2007), research in Uganda, acknowledge the importance of educational inputs is often far greater emphasized in developing than in industrialized countries. A school system of financial resources input in developing nations schools is importance, having access to them is essential.

In Kenya, ministry of education mandates all public primary schools to be supervised by the head teachers through various supervisory techniques. Head teacher’s roles are to ensure that teachers plan and attend their lessons as required by the school co-curriculum. Hence head teachers’ supervision on teachers is paramount for efficient and effective learning in schools (Wildman, 2015). The school supervisor is mandated to come up with schedule for supervision stating how they instill discipline in classes, how they merge learner differences in class, how the lessons are presented, content mastering, how to involve learners in class plus teaching methodologies and layout (Sule et al., 2015).

Quality Service delivery is vital when it comes to provision education especially at an early age which is primary level. In order to enhance service delivery with good quality, proper supervisory need to be implemented which all important key stakeholders are involved. It is evident that, better service quality in primary schools would attract more numbers of pupils. It has been noted that constant checking of teacher’s professional records and schemes is one of the important instructional supervision activity asserts (Watene, 2011). In Kenya, there are the quality assurance and standards officers which represents that government agencies in sub county education level, which are been appointed so as to conduct monitoring and evaluation frequently advising on quality standards in education based on all round aspects of education issues.. In Kenya, Education programme performance has been measured through student enrolment, education quality, customer or stakeholder’s satisfaction, cost, timeliness and achieving the desired objective as means of an effective indicator to measure of education programme performance (Nyikal, 2011).

**Statement of the Problem**

In primary schools in Kenya, stakeholders’ involvement is very critical in the supervision of the students' educational process. These stakeholders can have positive influence on the delivery of quality service. In this regard, proper participation and involvement in the supervision can help to improve service delivery. In Kenya's educational system, academic achievement of public school children have gotten full emphasis. Various stakeholders have paid attention to schools in the Mandera East Sub-County regarding performance. Mandera East Sub-County recorded progressive enrollment of pupils in primary schools for the period 2015-2019. An increase in government funding and the number of teachers employed by the Teachers Service Commission (TSC) has also been noted. This increase in enrollment, funding and the number of teachers has however been met with a significant slump in school performance. The poor performance has been attributed to flaws in monitoring and evaluation of education programmes in Mandera County. The supervision in education programmes was left entirely to the teaching staff and school administration while other stakeholders in management of school programmes taking a passive stance

With increased government funding and the number of teachers, the student poor performance of the public primary schools in Mandera East Sub-County as an issue to be answered through a study. therefore, it was viable to carry out the study to determine whether the influence of different stakeholders in the supervision had any impact on performance outcomes in quality service delivery in public primary schools in Mandera East Sub-County.

**Objectives of the Study**

1. Investigate the influence of parents’ participation in supervision of quality service delivery in public primary schools in Mandera East sub county Kenya.
2. Explore the influence of teacher participation in supervision of quality service delivery in public primary schools in Mandera East sub county Kenya.
3. Examine the influence of the government participation in the supervision of quality service delivery in public primary schools in Mandera East sub county Kenya.

Conceptual Framework

Parents Participation.
- Providing Teaching and Learning support
- Supporting school in Administration.
- Participation in curricular and extra curricular activities.
- Parent, school communication.
- School Decision making in BOM & PTA

Teachers Participation
- Task accomplishment
- Decision making and leadership style
- Student interaction
- Planning and management
- Training and Professional growth

Government Supervision
- Quality Assurance and Standards.
- Internal Quality Assurance.
- End term test and evaluating result
- Checking exercise books, Lesson notes, assignment
- Classroom observation
- Pupils’ motivation

Quality Service Delivery
- Desired Behaviour
- Academic Excellence.
- Extra curricular activities

Review of Literature

Levin and Belfield (2002), figured out three main domains of parent participation in supervision, and this are home participation, participation outside school and around school. Home participation covers the provision of a supportive learning environment around the home that gives out tools for learning like books and it also covers learning programme such as reading, assisting the kids with the homework and parent-child debate concerning the school day. This assist to shape and lay assumption concerning academic performance. participation outside the school are supports like instructing, academic groups and teacher’s projects. Lastly the school involvement covers the nomination affairs and supervision of qualified teachers and good school, parent school communication and involving parent-teacher’s meetings such as parent teachers’ association (PTA).

The ability of parents to monitor their children's academic success is crucial. Every parent ought to be involved in their kids' education. In addition, children require a solid foundation in their homes such routines, limits of what to do or not to do, support, and family norms, in order to achieve academically. These elements foster stability and a setting that encourages learning and academic success in addition
to success in daily life. (Livingstone, 2016). Parents' involvement in monitoring .The education of their children has long been recognized as a crucial factor in academic success and school development. According to a study conducted in Nigeria, Adeyemo (2019), teacher participation in decision-making affects students' learning and instruction in classrooms. A comparable situation in Nigeria about teachers' effectiveness and students' academic achievement in public schools shows that it is untrue to attribute the majority of test outcomes to the teacher. On the other side, Mokoena (2016) asserts that in order to effectively perform their leadership roles and responsibilities, school leaders who want to increase stakeholder trust should look at these indications of participative management efficacy. One of the jobs a teacher must complete is providing direct support to specific students by assisting them in understanding the lessons through supervision. The teachers must help the students grow through group projects and discussion. An improvement in the academic performance of the kids is the result of teachers putting a lot effort through the supervision role.

Expert knowledge in a particular field, with regard to methods and techniques and the capacity for issue analysis, is what is meant by a technical skill. It is done with the proper methodology and methodical approach. Current issues and trends in education must be known by teachers. To set standards for the others, they should also be knowledgeable in their fields. They should be familiar with accounting since they are in charge of institutions' finances. In Kenya's education sector, there are numerous instances of funds misappropriation (Ndiku, Simiyu & Achoka, 2019).

Schools in Kenya frequently have a hierarchical structure with teachers at the top of a pyramid of staff members. Teachers will be able to lead and oversee the operation of the entire school under this system, thanks to their superior knowledge and expertise. As a result of their inadequate participation in decision-making, which prevents teachers from feeling like a part of the schools, it’s likely that teachers work at half-speed, which has a negative impact on the efficiency and productivity of the schools. The hierarchical management of schools is challenged by secondary schools' dynamics of professionalism and variety of thought, which are a result of having teachers who have undergone professional preparation and the need to delegate decision-making to lower levels. Teachers have frequently participated in monitoring and decision-making to inspire students and foster a sense of community (Ndiku, Simiyu & Achoka, 2019).

Teacher supervision is also done through the supervisory agents evaluating teacher related documents including occurrence books, class registers, assessment reports among others. As claim by Pajak (2016) teachers’ supervision is the reason and application designed to upgrade the teacher’s classroom achievement. It relies mostly on information gleaned from classroom activities. The relationship that connects the teachers and the supervisor creates the foundation of the programme, producers and strategies lay down to upgrade. Students knowledge as the instructor raises the height of the classroom. supervision depends more on teachers’ direct-action control as opposed that are neither hierarchical or bureaucrat

Quality service delivery is vital when it comes to provision education especially at an early age which is primary level. In order to enhance quality service delivery, proper supervisory techniques need to be implemented. It is evident that, better service quality in primary schools would attract more numbers of pupils. It has been noted that constant checking of teacher’s professional records and schemes is one of the important instructional supervision activity asserts (Ndung’u, 2017).

Teacher supervision is an act of both internal and external quality assurance and standards in Kenya. The Head teacher is the main agent of quality assurance internally, while the Directorate of Quality Assurance at the Teachers Service Commission (TSC) supervises quality as an external agent. According to Akinfolarin (2017), government agencies in supervising of teachers is mainly supervising the task of teachers with target of helping them to solve their existing issue in classes so that students can take advantage from classroom activities. He also outlines that quality learning depend mainly of practical supervision of teachers.

**Research Methodology**

The research adopted a descriptive survey research design where data from selected respondents was collected. Mandera East Sub County has 41 public primary school, which 39 are regular schools, 2 are special needs schools with 234 TSC employed teachers, this are 182 male and 52 female, 2 sub county directors, one from ministry of education and Teacher’s service commission respectively, each primary school has Parents Teachers Association (PTA) appointed by parents and teachers which help the head teachers in school supervision. Each class in the school has a parent who is a PTA representative. The study targeted population was 288 respondents: sub county directors 2, PTA class Representatives 52, Teachers 234.

**Target Population**

<table>
<thead>
<tr>
<th>Category</th>
<th>Target population</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub county directors</td>
<td>2</td>
<td>1%</td>
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www.ijsrp.org
This study adopted the census method to select all the teachers and subcounty directors of education due to the size as well it covers a wide spectrum of the population. On the PTA class Representatives, the study purposively selected the standard eight PTA class representatives. The 41 schools in Mandera East sub county had 52 standard eight classes and a corresponding number of parents who were the PTA class representatives. The study did a census on all the 52 parents distributed in the 42 primary schools. The study used Primary data which was collected from primary sources in the field. Questionnaire were used as the main data collection instrument. The questionnaire was mainly quantitative. The research used quantitative methods to analyze data, so as to achieve knowledge of relationship between variables. The quantitative data was used in the study, then analyzed using the statistical package for social sciences. Preceding the analysis, a codebook for the different quantitative variables was prepared on the basis of the numbering structure of the questionnaires.

### Findings and discussions

**Table 1: Parents participation in Supervision of Quality Service delivery in Public Primary Schools.**

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents Help Teachers in Administrative Duties</td>
<td>280</td>
<td>2.1125</td>
<td>.98075</td>
</tr>
<tr>
<td>Parents help in Academic Clubs and Tutoring</td>
<td>280</td>
<td>2.5000</td>
<td>1.10236</td>
</tr>
<tr>
<td>Proper Communication between Parents and Teachers</td>
<td>280</td>
<td>3.1250</td>
<td>1.14045</td>
</tr>
<tr>
<td>Parents help Teachers in School Activities</td>
<td>280</td>
<td>1.9625</td>
<td>.84858</td>
</tr>
<tr>
<td>Parents Participate in School Meetings</td>
<td>280</td>
<td>3.6125</td>
<td>.90699</td>
</tr>
<tr>
<td>Parents Monitors Children’s Homework</td>
<td>280</td>
<td>2.5625</td>
<td>1.24111</td>
</tr>
<tr>
<td>Parents Monitors Childs Behaviour</td>
<td>280</td>
<td>3.3250</td>
<td>1.02839</td>
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<tr>
<td>Valid N (listwise)</td>
<td>280</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source: Researcher (2022)**

From the above descriptive statistics in table 1 above, the results indicated that the questions on parents participating in school meeting, Parents Monitors Childs Behaviour and there is proper Communication between Parents and Teachers had highest mean which was on upper side of Likert scale that was used in the study while the issues of Parents Help Teachers in Administrative Duties, Parents help in Academic Clubs and Tutoring, Parents Monitors Children’s Homework and Parents help Teachers in School Activities were on lower side of Likert scale. The parent involvement in school supervision has a general mean of 2.74 which is on the lower side as per the Likert scale between 1-5 which are either strongly disagree, disagree, undecided, agree and strongly agree. This can be concluded that in Mandera east sub county public primary school that there is no parent participation in supervision on quality service delivery. Henceforth this has affected quality service delivery of education.

This study is in tandem with the views of the Michigan Department of Education (2017) study, that parent participation in supervision is crucial to students’ performance and individual goals, and also illustrate that a student performance in school is not income or social stratum, but the ability to which that student’s family constitutes a home that inspire to study. The findings also agree with Sapungan and Mondragon (2018) on parental participation in supervision and its importance, barrier and benefits in children education in Schools in Singapore. The study findings are also in agreement with Harty et al 2017 who established that Parents play an important role in their children’s ability to achieve academically. Every parent should be involved in their children’s education. In order for children to succeed in academics, there needs to be a good foundation in place in their homes as well as routines, boundaries, support, and rules that govern the home.

**Table 2: Teacher’ Participation in Supervision of Quality Service delivery in Public Primary Schools**

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source: Researcher (2022)**

From the above descriptive statistics in table 1 above, the results indicated that the questions on parents participating in school meeting, Parents Monitors Childs Behaviour and there is proper Communication between Parents and Teachers had highest mean which was on upper side of Likert scale that was used in the study while the issues of Parents Help Teachers in Administrative Duties, Parents help in Academic Clubs and Tutoring, Parents Monitors Children’s Homework and Parents help Teachers in School Activities were on lower side of Likert scale. The parent involvement in school supervision has a general mean of 2.74 which is on the lower side as per the Likert scale between 1-5 which are either strongly disagree, disagree, undecided, agree and strongly agree. This can be concluded that in Mandera east sub county public primary school that there is no parent participation in supervision on quality service delivery. Henceforth this has affected quality service delivery of education.
Teachers Accomplish Task on Time  280  2.8500  1.17031
Teachers Observes Lessons and They are involved in Decision Making  280  3.6000  1.01383
Teachers Attitude is good towards Students  280  3.4250  1.02839
Good Cooperation between Head teachers and Teachers  280  3.5625  .93921
Teachers are Trained on Service Issues  280  2.7000  1.34447
Teachers are Involved in Lessons planning and Time Management  280  3.4625  .95392
Headteachers, Teachers have leadership skills and they have Schemes of work  280  3.2875  1.02121
Headteachers organize In-service Training for Teachers to Improve  280  1.7875  .88151

Valid N  280

Source: Researcher (2022)

From the results finding in table 2 above, it indicated that the questions on Teachers Observes Lessons and They are involved in Decision Making, Teachers Attitude is good towards Students, Good Cooperation between Head teachers and Teachers, Teachers are Involved in Lessons planning and Time Management, Headteachers and Teachers have leadership skills and they have Schemes had a mean which was on upper on upper side of Likert scale while the issues on Teachers Accomplish Task on Time, Teachers are Trained on Service Issues and Headteachers organize In-service Training for Teachers to Improve had a mean which was on the lower side of the Likert scale. The overall mean of the question of teacher’s participation in supervision in public primary in mandera east sub county is 3.08 and this means in the Likert scale it is on the middle of the scale. Therefore, those who either strongly disagree or disagree and those who are agree or strongly agree are equal. The study is in agreement with the notion that the academic performance of students in public primary schools is positively and significantly impacted by teachers' involvement in school administration. According to Knell (2016), teachers' participation in school governance and the creation of discipline policies boosts their morale and motivation, which in turn enhances the academic performance of their students. The study supports Riley (2018) who found that the employees, parents, and governors view teachers as the primary source of leadership. As a result, it is necessary for teachers to be aware about educational issues.

Table 3: Government Supervisory role in ú Service Quality in Public Primary Schools

<table>
<thead>
<tr>
<th>Statement</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Target set for Pupils Performance</td>
<td>280</td>
<td>3.8750</td>
<td>.48718</td>
</tr>
<tr>
<td>Pupils are Closely Monitored</td>
<td>280</td>
<td>3.2125</td>
<td>1.03964</td>
</tr>
<tr>
<td>Pupils are well Disciplined</td>
<td>280</td>
<td>3.7875</td>
<td>.70610</td>
</tr>
<tr>
<td>Special attention given to Pupils with Low Grade</td>
<td>280</td>
<td>2.6250</td>
<td>1.24651</td>
</tr>
<tr>
<td>Head Teachers and Quality Assurance officers Inspect Pupils Exercise Books and Assignment</td>
<td>280</td>
<td>3.6375</td>
<td>1.00937</td>
</tr>
<tr>
<td>Pupils Attendance is Monitored</td>
<td>280</td>
<td>3.2625</td>
<td>1.16645</td>
</tr>
</tbody>
</table>

Source: Researcher (2022)

From the results depicted in table above, it can be noted that the questions on whether minimum targets were set for pupils’ performance, Pupils are Closely Monitored, Pupils are well Disciplined, Head Teachers and Quality Assurance officers Inspect Pupils Exercise Books and Assignment Pupils Attendance is Monitored had a mean which was on upper side of Likert scale while the issue Special attention given to Pupils with Low Grade had a mean which was on the lower side of the Likert scale. The questions that have been posed on pupils’ supervision has obtained a mean of 3.4 as per Likert scale it lays in the middle of the scale which remain 50/50 in terms of those who either strongly disagree or disagree and those who are agree or strongly agree. Government participation in supervision is seen as a pathway for improved quality service delivery in schools and it increases decision making efficiency. The study agrees with Daniel and Namale (2016), that the head teacher as the chief agent of internal quality supervisor may have a great challenge in multi-tasking. Daniel and Namale (2016), in their study noted that there’s is a great challenge posed on the head teachers while supervising due to the multi-tasking roles they carry out as per
their administrative duties. Dali, Daud and Fauzee(2017) in their study seconded the study by Daniel and Namale (2016) by mentioning that there are numerous roles subjected to the school principals by the ministry of education, whereby other duties could be delegated since they are not of importance to them.

Conclusion
The study findings rated parent participation quite highly by the respondents. The study therefore concludes that parental participation in supervision affects quality service delivery in public primary schools. From the field results, the study concludes that most of the parents in Mandera East actually support the school through meetings. The study findings showed head teachers observe and monitor teachers lesson planning and time management. The study can therefore conclude that teacher’s participation in supervision affects quality service delivery in public primary schools. From the study results, the study concludes that that teacher training on service issues is relatively low. Based on the study findings, the study concludes that schools in Mandera East set minimum targets for pupils, therefore the study concludes that government supervision affects service quality in public primary schools. The study can also conclude that the government in supervision in rural areas are quite limited in Mandera East Sub County; this has affected the attention given per student due to the high number of pupils per class which requires teachers’ attention in different units and classes.

Recommendations
There is need of Involvement parents in the education of their children by encouraging them in helping the kids with homework, monitoring and promoting the learning activities at home. The study encourages parents and teachers to work together on their children's academics through consultation process and monitoring the child academic journey, as a result national examination results may improve. According to the parents and teachers questioned in this research, the parents-teachers' cooperation in public primary school was lacking or sporadic at best. The study also recommends that head teachers, quality assurances standards officers should allow teachers to be involved in school supervision and other administrative duties, and school activities. The study also recommends that the government should come up with policies that enable external stakeholders to be part of the school management and administrative issues. For better levels of performance to be recorded by students in Mandera East Sub County, the study recommends the stakeholders in education sector needs to improve their methods of supervision, working with teachers and head teachers and more so it requires involvement of different stakeholders. There is a need for principals to help teachers grow by sending them to seminars and setting up exchange programs with schools that are doing well. The study recommends priority should be given to education for the goal of maximizing the potential of increased effectiveness via results-oriented management and evaluation. Lack of proper supervision by the government agencies in Mandera East Primary School has resulted poor coverage of curriculum content in schools, which can be related to poor performances in schools. The school management specially those who represent government should put in place Meetings with teachers, principals, quality assurance and standards officers, as well as sub county education officers, would be necessary for an effective communication plan so that they can improve the supervision of schools in relation with quality service delivery.

Recommendation for Further Research
The study sought to find out the involvement of key stakeholders in supervision and quality service delivery in public primary schools in Mandera East sub county, Kenya. The researcher recommends that the same study should also be carried out in other counties. The researcher also recommends that other different variables should be used apart from the ones tested in this study such as supervisory skills and school system survey as well as how to ensure involvement of key stakeholders in supervision in the school learning process.

References

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Radiation Dose Assessment of Patients undergoing Lumbar Spine Radiography

1 Bamidele Lateef  2 Osahon. O. David

1 Department of Science Laboratory Technology, Osun State College of Technology, Esa – Oke, Nigeria.  2Department of Physics, University of Benin, Benin – City, Nigeria.

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Abstract- Measurement of patient dose is an essential tool in optimizing dose and protecting patient against the ionizing radiation during diagnostic radiology. Quantifying the patient dose safe guard both the patient undergoing examination and medical personnel from health hazard of ionizing radiation. In this study the entrance surface air kerma (ESAK) of 150 patients undergoing lumbar spine radiographic examinations in eight radiological departments in Southern part of Nigeria. Patient doses were evaluated based on IAEA code of practice using exposure factors. The calculated mean ESAK values ranged 1.68 mGy to 12.66 mGy for lumbar spine AP and ranged from1.91 mGy to 10.53 mGy for lumbar spine LAT. The results obtained in this study were compared with the values of doses reported in UK 2010 review and it was found to be higher in some health facilities. The higher doses observed in this survey can be attributed to the use of higher tube loading (mAs) during exposures, which shows lack of optimization of exposure settings.

Index Terms- Entrance surface air kerma, radiation dose, lumbar spine, exposure factors.

I. INTRODUCTION

X-ray is the most used ionizing radiation in medical imaging for diagnosis both in developing and developed countries. It contributed majorly, to collective effective dose of the general populace but it plays a major role in health care delivery system. [1-3]

Effect of ionizing radiation on human tissue made it necessary to develop a method of evaluating radiation dose in all fields of human endeavor. The parameters recommended for evaluating and monitor the patient dose in conventional radiography by International Atomic Energy Agency (IAEA) in 1995 and European Union in 1997 was the entrance surface dose (ESD) and the measuring method were clearly spelt out in the European guidelines.[4,5] The ESD measured in mGy or μGy, is defined as the radiation dose at the surface of the patient where the X-ray field enters the body. It includes contributions from primary beam and also the radiation backscattered from the tissue below the surface. An alternative method is in terms of incident air kerma (IAK) which is to take free-in-air measurements without the contribution of backscattered radiation from the patient.[6] Incident air kerma and entrance surface air kerma are two important quantities in X-ray diagnostic radiology.[2] The entrance surface air kerma is defined as the kerma to air measured on the central beam axis at the position of the patient or phantom surface. This measurement includes radiation incident on the patient or phantom and backscattered radiation.

Various radiation dose surveys had been carried out in Nigeria. [7-17] These studies had shown large intra- and inter-radiological center dose variation for the same diagnostic procedure which shows that radiological procedures were not optimized. These large dose variations showed that the patients were given unwanted radiation doses and that radiographic process optimization is possible. Also, there is possibility for substantial reductions in the patient doses without affecting radiographic image quality. Due to the wide patient dose variations observed in various survey, the Royal College of Radiologists (RCR) and the National Radiological Protection Board (NRPB) recommended that the regular monitoring of patient dose should be an essential part of quality assurance (QA) programme in diagnostic radiology. [18]

The regular monitoring of patient doses became necessary in Nigeria; because, in previous studies, wide variations of doses to patients were obtained. Also, it was reported that there are over 4000 X-ray machines in Nigeria with less than 5% of them being under any form of regulatory control [16] and that there is no published National Diagnostic Reference Levels (NDRLs) which is essential for the management of patient dose to ensure that the benefit outweighs any health hazard to the patients.[16,19]

The current study aimed at carrying out dose assessment of patients undergoing lumbar spine radiography in some health facilities in southern Nigeria.

II. MATERIALS AND METHODS

Eight hospitals were purposely selected to include all other health care systems except primary health care centers that do not have radiological centers in southern part of Nigeria for this study. These include: Federal Medical Center (FMC) Ido Ekiti; Ayinke Diagnostic Center (ADC) Ilesa; Central Hospital (CH) Benin – City; Ladoke Akintola University Teaching Hospital (LTH)
Osogbo; Oba Adenle Memorial Hospital (OAMH) Ilesa; University of Benin Teaching Hospital (UBTH) Benin – City; University Teaching Hospital (UTH) Ado – Ekiti; and Obafemi Awolowo University Teaching Hospital Complex (OAUTHC) Wesley Guild Ilesa.

The Quality Control (QC) test for each machine was carried out using QC kit (NERO™ 6000m, manufactured by Victoreen, INC, Cleveland, Ohio, USA). The QC kit was positioned at the centre of the beam axes at focus to image distance (FID) of 100cm.[20] The QC tests carried out on each machine are: the kVp parameters (accuracy, reproducibility and consistency); the exposure time (reproducibility and accuracy); and the output linearity coefficient and output reproducibility.

Exposure parameters and patient characteristics such as tube potential (kVp), focus-to-film distance (FFD), tube loading (mAs), filtration of the machine (inherent and added), exposed film area (assumed to be beam area), thickness of the exposed (irritated) part of the body, projections (e.g. AP, PA and LAT) were recorded during the routine exposure.

The indirect method of calculating ESAK was adopted in this study. According to the IAEA Code of Practice [2], the incident air kerma is calculated using:

\[ K_i = \frac{1}{4} \left( \frac{d}{d_{FFD}} + \frac{1}{F} \right)^2 \]

Where:
- \( Y(d) \) is the output (mGy/mAs) of the X-ray tube at particular exposure settings
- \( d \) is the focus to chamber distance
- \( P_i \) is the tube loading during the exposure of the patient
- \( d_{FFD} \) is the focus table distance
- \( t_p \) is the patient thickness at the irradiation site

The ESAK was calculated from incident air kerma by multiplying using an appropriate backscatter factor:

\[ ESAK = K_i \times BSF \]

Table 1 present the results of quality control of the X-ray units in all the units. According to American Association of Physicists in Medicine (AAPM 2002), the kVp accuracy should not exceed ±5% and the reproducibility and consistency should not exceed 10%. The kVp accuracy that was calculated ranged from 0.32% to 0.96% which was lower than the tolerance limit. The kVp reproducibility and consistency ranged from 0.14% to 0.65% and 0.30% to 0.95% respectively. This shows that the exposure time accuracy and reproducibility of the x-rays were up to standard in all X-ray units. Also, the output linearity coefficient and the reproducibility of the machines in all X-ray units were within the limits recommended by the American Association of Physicists in Medicine. [20]

### Table 1: The Quality Control test of the X-ray units

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Measurements</th>
<th>Acceptable Limits</th>
<th>LTH</th>
<th>ADC</th>
<th>OAMH</th>
<th>UTH</th>
<th>OAUTH</th>
<th>FMC</th>
<th>CH</th>
<th>UBTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVP</td>
<td>Accuracy kVp</td>
<td>±5%</td>
<td>0.32%</td>
<td>0.96%</td>
<td>0.84%</td>
<td>0.52%</td>
<td>0.65%</td>
<td>0.75%</td>
<td>0.78%</td>
<td>0.85%</td>
</tr>
<tr>
<td>Reproducibility %</td>
<td>≤10%</td>
<td>0.14%</td>
<td>0.48%</td>
<td>0.42%</td>
<td>0.25%</td>
<td>0.45%</td>
<td>0.58%</td>
<td>0.65%</td>
<td>0.53%</td>
<td></td>
</tr>
<tr>
<td>Consistency %</td>
<td>≤10%</td>
<td>0.95%</td>
<td>0.85%</td>
<td>0.50%</td>
<td>0.64%</td>
<td>0.45%</td>
<td>0.75%</td>
<td>0.74%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td>Accuracy %</td>
<td>≤5%</td>
<td>0.30%</td>
<td>0.50%</td>
<td>0.50%</td>
<td>0.50%</td>
<td>0.65%</td>
<td>0.76%</td>
<td>0.76%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Time</td>
<td>Reproducibility</td>
<td>≤0.05</td>
<td>0.03%</td>
<td>0.03%</td>
<td>0.03%</td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.03%</td>
</tr>
<tr>
<td>Output</td>
<td>Linearity</td>
<td>≤0.10</td>
<td>0.07%</td>
<td>0.09%</td>
<td>0.09%</td>
<td>0.04%</td>
<td>0.06%</td>
<td>0.08%</td>
<td>0.06%</td>
<td>0.05%</td>
</tr>
<tr>
<td>Reproducibility</td>
<td>≤0.05</td>
<td>0.04%</td>
<td>0.04%</td>
<td>0.02%</td>
<td>0.03%</td>
<td>0.04%</td>
<td>0.03%</td>
<td>0.04%</td>
<td>0.03%</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Mean values of exposure parameters for routine lumbar spine AP examinations. Ranges are shown in parentheses

<table>
<thead>
<tr>
<th>Hospital</th>
<th>No of patient</th>
<th>Patient thickness (cm)</th>
<th>Tube potential (kVp)</th>
<th>Exposure setting (mAs)</th>
<th>Focus-film-distance (FFD) cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTH</td>
<td>24</td>
<td>22 (13 -35)</td>
<td>76 (72 – 80)</td>
<td>45 (40 – 57)</td>
<td>103 (102 – 104)</td>
</tr>
<tr>
<td>OAUTHC</td>
<td>16</td>
<td>27 (18 – 36)</td>
<td>87 (73-96)</td>
<td>(91/40-125)</td>
<td>117(110-125)</td>
</tr>
<tr>
<td>UBTH</td>
<td>22</td>
<td>23 (21 – 32)</td>
<td>85 (74 – 91)</td>
<td>31 (20 – 40)</td>
<td>115 (100 – 160)</td>
</tr>
<tr>
<td>OAMH</td>
<td>14</td>
<td>26 (24 – 29)</td>
<td>75 (73 -77)</td>
<td>45 (40 – 50)</td>
<td>116 (110 – 120)</td>
</tr>
<tr>
<td>ADC</td>
<td>14</td>
<td>22 (14 – 28)</td>
<td>93 (89 -96)</td>
<td>103 (100 – 110)</td>
<td>116 (110 – 120)</td>
</tr>
<tr>
<td>UTH</td>
<td>24</td>
<td>24 (20 – 28)</td>
<td>88 (78-97)</td>
<td>40 (30-50)</td>
<td>108 (96-120)</td>
</tr>
<tr>
<td>CH</td>
<td>14</td>
<td>28 (26 – 34)</td>
<td>103 (90 – 110)</td>
<td>170 (100 – 250)</td>
<td>93 (90 – 95)</td>
</tr>
<tr>
<td>FMC</td>
<td>22</td>
<td>23 (22 – 27)</td>
<td>97 (95 – 100)</td>
<td>45 (40 -50)</td>
<td>92 (90 – 95)</td>
</tr>
</tbody>
</table>

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The technical parameters employed for lumbar spine AP is shown in Table 2. Variations were observed in tube voltage (kVp) and tube load (mAs) due to the varying weight of the patient. The film to focus distance (FFD) employed in some radiological units were inconsistent with the international recommended values. This was observed at CH and FMC where the FFD employed, ranged from 90.0 cm to 95.0 cm with mean value of 92.0 cm and 93.0 cm respectively compared to FFD range of 100.0 cm to 150.0 cm with mean value of 115.0 cm recommended by European guidelines (EC, 1996). The kVp and mAs employed in all X-ray units were comparable with the value used in UK – 2010 review.[21]

The mean values and ranges of exposure parameters used lumbar spine LAT examination in all X-ray units are shown in Table 3. The FFD employed in most X-ray units were consistent with the stipulated value by the international organization except in UTH and CH. The kVp and mAs employed in most units were within the value used in UK – 2010 review.

### Table 3: Mean values of exposure parameters for routine lumbar spine LAT examinations. Range are shown in parentheses

<table>
<thead>
<tr>
<th>Hospital</th>
<th>No of patient</th>
<th>Patient Thickness (cm)</th>
<th>Tube potential (kVp)</th>
<th>Exposure setting (mAs)</th>
<th>Focus-film-distance (FFD) cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTH</td>
<td>24</td>
<td>23 (22 – 27)</td>
<td>80 (75-85)</td>
<td>49 (35-64)</td>
<td>132 (104 -180)</td>
</tr>
<tr>
<td>OAUTHC</td>
<td>16</td>
<td>25 (23 – 32)</td>
<td>80 (81-96)</td>
<td>110 (64-125)</td>
<td>114 (110-123)</td>
</tr>
<tr>
<td>UBTH</td>
<td>22</td>
<td>22 (17 – 28)</td>
<td>80 (83-96)</td>
<td>44(32-50)</td>
<td>108(100-130)</td>
</tr>
<tr>
<td>OAMH</td>
<td>14</td>
<td>24 (20 – 28)</td>
<td>87 (77 – 96)</td>
<td>45 (40 – 50)</td>
<td>105 (100 –120)</td>
</tr>
<tr>
<td>ADC</td>
<td>14</td>
<td>28 (26 – 34)</td>
<td>92 (90 – 96)</td>
<td>112 (100 – 125)</td>
<td>115(110 – 120)</td>
</tr>
<tr>
<td>UTH</td>
<td>24</td>
<td>27 (18 – 36)</td>
<td>86 (75-97)</td>
<td>35 (20-50)</td>
<td>108 (96-120)</td>
</tr>
<tr>
<td>CH</td>
<td>14</td>
<td>23 (21 – 32)</td>
<td>104 (100-110)</td>
<td>200 (150-250)</td>
<td>94 (90-98)</td>
</tr>
<tr>
<td>FMC</td>
<td>22</td>
<td>26 (24 – 29)</td>
<td>92 (90-95)</td>
<td>43 (40-50)</td>
<td>95 (90-100)</td>
</tr>
<tr>
<td>UK Guideline</td>
<td>NA</td>
<td>NA</td>
<td>88 (75 -118)</td>
<td>48 (1-560)</td>
<td>NA</td>
</tr>
</tbody>
</table>

The statistical distribution of the ESAK values from the X-ray units for the lumbar spine AP is shown in Table 4. From the Table, the ESAK ranged from 0.46 to 2.44 mGy with mean value of 1.68 mGy in LTH, the value ranged from 2.49 to 6.08 mGy with the mean of 5.02 mGy in OAUTHC. In OAMH; the ESAK value ranged 1.77 to 2.65 mGy with the mean value of 4.03 mGy and at ADC, it ranged from 1.56 to 3.42 mGy with mean value of 4.40 mGy.

### Table 4: Distribution of Entrance surface dose air kerma (ESAK) in mGy for lumbar spine AP in all health facilities

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Number Of Patients</th>
<th>Min 1st quartile</th>
<th>Median</th>
<th>Mean</th>
<th>3rd quartile</th>
<th>max</th>
<th>Max/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTH</td>
<td>24</td>
<td>0.46</td>
<td>1.44</td>
<td>1.77</td>
<td>1.68</td>
<td>1.97</td>
<td>2.44</td>
</tr>
<tr>
<td>OAUTHC</td>
<td>16</td>
<td>2.49</td>
<td>5.35</td>
<td>5.37</td>
<td>5.02</td>
<td>5.45</td>
<td>6.08</td>
</tr>
<tr>
<td>UBTH</td>
<td>22</td>
<td>0.73</td>
<td>1.57</td>
<td>2.54</td>
<td>2.31</td>
<td>2.81</td>
<td>3.96</td>
</tr>
<tr>
<td>OAMTH</td>
<td>14</td>
<td>2.65</td>
<td>3.15</td>
<td>3.94</td>
<td>4.03</td>
<td>4.82</td>
<td>5.57</td>
</tr>
<tr>
<td>ADC</td>
<td>14</td>
<td>3.42</td>
<td>4.09</td>
<td>4.42</td>
<td>4.40</td>
<td>4.72</td>
<td>5.33</td>
</tr>
<tr>
<td>UTH</td>
<td>24</td>
<td>0.65</td>
<td>2.01</td>
<td>3.01</td>
<td>2.72</td>
<td>3.72</td>
<td>4.20</td>
</tr>
<tr>
<td>CH</td>
<td>14</td>
<td>5.56</td>
<td>7.58</td>
<td>11.31</td>
<td>12.66</td>
<td>16.38</td>
<td>22.45</td>
</tr>
<tr>
<td>FMC</td>
<td>22</td>
<td>2.45</td>
<td>3.92</td>
<td>5.37</td>
<td>5.74</td>
<td>7.38</td>
<td>9.37</td>
</tr>
</tbody>
</table>

In UTH, the ESAK value ranged from 0.65 to 6.46 mGy, the mean value is 2.72 mGy and in CH, the value of ESAK ranged from 5.56 to 22.45 mGy with the mean value of 12.66 mGy. While the dose value ranged from 2.45 to 9.37 mGy with the mean of 5.74 mGy im FMC, the value ranged from 0.73 to 3.96 mGy and the mean value is 2.31 mGy in UBTH.
The range factors (i.e minimum/maximum ratio) ranged from 1.56 in ADC to 6.46 in UTH, this shows that there is a significant intra- and inter- radiological center dose variation. Statistical distribution of the ESAK values for individual patient for the lumbar spine LAT in all the health facilities is presented in Table 5. The ESAK value ranged from 0.72 to 3.25 mGy with the mean of 1.91 mGy, it ranged from 4.55 to 6.08 mGy with the mean of 6.78 mGy in OAUTHC. In OAMTH, the ESAK value ranged from 3.79 to 5.46 mGy with mean value of 4.34 mGy and it ranged from 3.45 to 5.74 mGy with the mean of 4.87 mGy in ADC.

### Table 5: Distribution of Entrance surface dose air kerma (ESAK) in mGy for lumbar spine LAT in all health facilities.

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Number Of Patients</th>
<th>Min</th>
<th>1st quartile</th>
<th>Median</th>
<th>mean</th>
<th>3rd quartile</th>
<th>max</th>
<th>Max/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTH</td>
<td>24</td>
<td>0.72</td>
<td>1.43</td>
<td>1.65</td>
<td>1.91</td>
<td>2.41</td>
<td>3.25</td>
<td>4.51</td>
</tr>
<tr>
<td>OAUTHC</td>
<td>16</td>
<td>4.55</td>
<td>6.39</td>
<td>6.59</td>
<td>6.78</td>
<td>6.90</td>
<td>7.08</td>
<td>1.34</td>
</tr>
<tr>
<td>UBTH</td>
<td>22</td>
<td>2.43</td>
<td>3.63</td>
<td>3.69</td>
<td>4.04</td>
<td>4.35</td>
<td>5.99</td>
<td>2.46</td>
</tr>
<tr>
<td>OAMTH</td>
<td>14</td>
<td>3.79</td>
<td>4.24</td>
<td>4.48</td>
<td>4.34</td>
<td>4.79</td>
<td>5.46</td>
<td>1.44</td>
</tr>
<tr>
<td>ADC</td>
<td>14</td>
<td>3.45</td>
<td>4.26</td>
<td>5.14</td>
<td>4.87</td>
<td>5.74</td>
<td>5.74</td>
<td>1.66</td>
</tr>
<tr>
<td>UTH</td>
<td>24</td>
<td>2.44</td>
<td>2.46</td>
<td>2.45</td>
<td>3.02</td>
<td>3.31</td>
<td>4.16</td>
<td>1.70</td>
</tr>
<tr>
<td>CH</td>
<td>14</td>
<td>5.45</td>
<td>6.45</td>
<td>10.53</td>
<td>14.27</td>
<td>18.35</td>
<td>30.57</td>
<td>5.61</td>
</tr>
<tr>
<td>FMC</td>
<td>22</td>
<td>2.44</td>
<td>2.46</td>
<td>2.45</td>
<td>3.02</td>
<td>3.31</td>
<td>4.16</td>
<td>1.70</td>
</tr>
</tbody>
</table>

The ESAK value for individual patient ranged from 2.56 to 4.37 mGy with the mean value of 3.33 mGy in UTH and it ranged from 5.45 to 30.45 mGy with the mean of 14.27 mGy in CH. In FMC, it ranged from 2.44 to 4.16 mGy with mean of 3.02 mGy and ESAK value ranged from 2.44 to 4.16mGy with mean of 4.02 mGy in UBTH. The range factor ranged from 1.34 in OAUTHC to 5.61 in CH, which shows that there is significant intra- and inter- radiological center dose variation. The variation observed in this study are smaller probably due to the smaller number of health facilities involved since, wide dose variation were always observed in large scale survey. Although various reasons have been adduced for wide variation in patient doses for the same type of examination. These include: the levels of training of the operators, patient anatomical thickness; differences in exposure technique employed by the radiographers; the film-screen combination type in use; and the status of implementation of radiation protection standards, the basics is that the optimization of the radiation protection is not achieved.

### III. Conclusion

Entrance surface air kerma (ESAK) were measured for lumbar spine (AP & LAT) using mathematical model from exposure parameters in eight health facilities in Southern part of Nigeria.

The results obtained in this study show that generally the kVp and mAs employed in most of X-ray units were comparable with those reported in 2010 UK review. The mean ESAK value obtained for lumbar spine AP in this study were lower than 5.7 mGy obtained in 2010 UK review except in CH where the mean ESAK obtained is 12.66 mGy. However, there is a significant dose variation which could mean unjustified risk to patients undergoing similar types of radiographic examinations and that there is the possibility of dose reduction to patients without affecting image quality.

Since the quality assurance (QA) in radiology is proven to be a powerful tool for decreasing doses and increasing diagnostic efficiency, there is need for QA program which involves training and re-training of personnel, constant monitoring of X-ray facilities in all these health facilities in order to help the operators in dose optimization.

### References


AUTHORS

First Author – Bamidele Lateef , Department of Science Laboratory Technology, Osun State College of Technology, Esa – Oke, Nigeria.

Second Author – Osahon. O. David, Department of Physics, University of Benin, Benin – City, Nigeria.

Correspondence author e – mail: bamla15@gmail.com +2348067912315
A Needs-Based Evaluation Of ESP Materials In The Bachelor Program Of Applied Linguistics At An LPDR University

NGUYEN THI HONG MINH *, SONEPHET KEODUANGSAVAHT**

* Faculty of Foreign Languages Education, Thai Nguyen University of Education, Vietnam  
** Faculty of Linguistics and Humanities, Savannakhet University, Laos

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Abstract - The present study aims to evaluate the current ESP materials used in a LPDR university from students’ perspectives as well as propose changes to the learning documents based on better considerations of students’ needs. As an exploratory study, it employed questionnaires as the primary research instrument to collect 100 students’ opinions of the in-use ESP materials in the mentioned university and their expectations for the future learning materials. The findings indicated that ESP materials should be revised to ensure more access to communicative English teaching and more opportunities for students’ professional learning. A need-based proposal of the ESP materials was introduced to the learners for their initial ideas of the changes. The result suggested that students were satisfied with the proposed changes of the new ESP materials, which could be the first starting point to the revision and design of the new ESP materials in that LPDR university.

Keywords: ESP, Need-based evaluation, ESP material evaluation

I. INTRODUCTION

With its widespread use as the international language, English has now been used not only as the medium of communication in life aspects but also as the language for academic and professional purposes in many countries. ESP (English for Specific Purposes), similarly to EAP (English for Academic Purposes) and EOP (English for Occupational Purposes), has been dimensions in English teaching and learning with more focus on learners’ occupational orientation and thus they aim at a specific audience in a specific environment, and the course materials are pertinent to the learners' specialized field of study (Baleghizadeh & Rahimi, 2011). More specifically, Silva (2002) claimed that ESP conveys students’ specific purposes for learning a second language and that it is a reaction to students' needs and the acquisition of language connected to communication outside of the classroom, particularly in their studies and future vocations.

In Laos, like many other countries where English is not the native or the second language, ESP courses are now mandatory at universities as there has been a growing demand in learning the language through subject contents and for occupations. To succeed in their academic fields, students are required to be proficient in written and spoken English, which is obviously important in the era of globalization. However, ESP courses are largely limited to learning specific terminologies, grammar points, and translating texts, which potentially disregards learners' interests and needs and frequently results in low motivation and poor performance in their future profession. The teachers' usage of inappropriate materials may be regarded as a contributing factor to this situation as it can be challenging to determine what factors should be taken into account when selecting an English textbook, and there has been inadequacy of needs survey and textbook evaluation for better decision making.

The Faculty of Linguistics and Humanities in this aforesaid LPDR university offers an Applied Linguistics degree for undergraduate students in which the ESP components include such courses as English for Commerce, English for Business, English for Tourism - hospitality, and English for successful Meetings. Nevertheless, it is revealed that the current ESP materials used in this higher education institution had not been tailored to the needs, preferences, or requirements of the students. Therefore, this study is an attempt to initiate evaluation of the ESP materials and proposed changes in the design of such learning resources based on students’ perceptions.

II. LITERATURE REVIEW

English for Specific Purposes, or ESP as it is abbreviated, is a term that is frequently used nowadays by instructors, experts, and teachers. There are many definitions of ESP, but they all center on how ESP instruction helps students who want to learn English for a specific
purpose in addition to learning relevant processes. These objectives could be academic, professional, or anything else, and ESP claims to be able to adequately prepare its students to meet the necessary objectives.

According to Dudley-Evans & St John (1998), Hutchinson & Waters (1987), Munby (1978), Robinson (1991), and Strevens (1898), all of which were cited by Chien et al. (2008), it has traditionally been divided into two main classes: English for Academic Purposes (EAP) and English for Occupational Purposes (EOP). The ESP movement later grew and developed into a vital and specific field due to a variety of factors, including the dominance of English as the global language of science, technology, and business as well as the growing influence of English-speaking nations (Dudley-Evans & St. John, 1998 as cited in Karimi, 2006).

ESP is a method of teaching languages that, according to Paltridge and Starfield (2013), is the acquisition of "a set of transferable generic language and literacy skills that are deemed to be appropriate in the majority of academic and workplace settings." The focus of ESP is developing appropriate courses based on learner need analysis, which are then followed by important procedures of syllabus design, material design, selection, and evaluation, classroom teaching, and evaluation moving forward linearly (Hutchinson & Water, 1987). As is evident, one of the most crucial components of teaching ESP is evaluation. The most fundamental definition of evaluation is to ask questions, receive responses, form judgments, prepare responses, and take appropriate action (Lynch, 1996).

Although there are many approaches to the evaluation of teaching materials, they are significantly less prevalent in the field of ESP even though materials and textbooks are the primary tools for forming students' knowledge, attitudes, and principles (Noooreen & Arshad, 2010). In light of this, Ansari and Babayi (2002), revealed that instructors or teachers have been in charge of reviewing textbooks, making the evaluation of instructional materials a significant and crucial aspect of a teacher's job.

All assessment research aims to recommend improvements and make the situation better. The effectiveness of textbooks is evaluated using a variety of techniques. Pre-use evaluation, in-use evaluation, and post-use evaluation are the three categories of evaluation that Cunningsworth (1984) takes into account (as stated in Cepen, 2008). There are two types of evaluation, according to Mukundan (2004) as referenced in Nasiri (2011) and Ellis (1997 as cited in Tok, 2010): predictive evaluation and retrospective evaluation. Balezighzadeh and Rahimi (2011) divide evaluation into formative and summative kinds, as indicated by Dudley-Evans and St John (1998). McDonough and Shaw (2003) consider three sorts of evaluations: external, internal, and total.

Two well-known ESP levels of evaluation are proposed by Hutchinson and Waters (1987, as quoted as Hatam, 2012): learner assessment and course evaluation. These two modes did not necessarily separate, in their opinion. In other words, student evaluations take into account both their performance and, to some extent, the course's usefulness. The three main ways that learners are assessed in ESP are through placement tests, achievement tests, and proficiency tests. Hutchinson and Waters (1987), who are quoted by Hatam (2012), also state that there are four important factors to take into account while evaluating an ESP course a) what should be evaluated? b) how can ESP courses be evaluated? c) who should be involved in the evaluation? d) when (and how often) should evaluation take place?

Tomlinson (2001) devised a technique for curriculum evaluation that enables material developers, instructors, and administrators to evaluate the worth of the resources they have used with students. Ellis (2011) focuses on micro-evaluation, which has to do with how subject-related classroom tasks affect students. It aids in determining the task's viability and goes beyond impressionistic judgment. On how it works and how it might be improved for usage later. It evaluates its fit for the objectives of the learners as well as the constraints of certain circumstances (Kalsoom Jahan, Syed Kazim Shah & Sumera Shan Ahmad, 2019).

There have been a large body of research on material evaluation across Asian countries and Laos is included. Using McDonough and Shaw's (2003) methodology, Davari, Iranmehr, and Erfani (2013) evaluated the ESP textbooks used at Payam Nour University in Iran. Low face validity, a lack of material review and updating, ineffective and traditional activities and drills, and an incorrect concept of ESP were the book's main shortcomings. The basic conclusion they reached was that the theory and practice presented in the textbook are out of alignment. Their (2006) conducted a study at the Myanmar Institute of Technology to assess the efficacy and suitability of the textbook used to teach English to religious students. The results showed that the textbook used in the course was appropriate for several reasons. For instance, textbooks did not help teachers and students meet their needs, they did not help students develop their critical thinking skills, and they did not help students communicate more effectively in real-world settings, Khoshimani (2014) also did a study to assess ESP textbooks used nationally based on the views of Iranian teachers. The findings of their investigation demonstrated the teachers' dissatisfaction with ESP textbooks since they fell short of their expectations.

In Laos context, Xayaphet (2017) studies the evaluation of curricula from the perspective of English in a business setting. He found that (1) final-year students still struggled with English. The issues revealed that not just English in business, but the entire curriculum, should be used to address them. (2) students were unable to learn the material that had been taught to them. (3) many students lacked business abilities and were unfamiliar with fundamental business terms and principles. When taking into account students' English ability, it appears that teaching in English has a clear limit in terms of solving this problem. As a result, business-related lessons should be taught in Lao.

Udomluck (2017) performed a study on curriculum evaluation and early childhood teacher education curriculum of Dongkhamxang Teacher Training Colleges in Laos including the following issues: (1) Context: Curricular structures, courses, and materials were appropriate to fulfill curriculum objectives and context, according to the research findings. (2) Input: The input addressed the credentials of the professors and students. Materials for learning and teaching needed to be improved. Program budgeting received a fair rating; (3) Process: The process satisfied the needs of managing the curriculum and the student teaching practicum; (4) Product: The knowledge and teaching practicum satisfied the needs of professional practice and professional behavior, and (5) Impact: It satisfied graduates and employers.
At Champhasak and Souphanouvong Universities in Laos, Yommana Syhakhang, Thongkham Hungsavath, and Vanvichit Kitthikoun (2015) conducted a comparative analysis of viewpoints on the English curriculum and teaching methodology. The finding shows that both universities should contribute enough funding to create fresh, modern programs. The collaboration of knowledgeable teaching staff, local and international specialists, and most crucially, student engagement is required for the development of curriculum procedures. Additionally, the five dimensions of education taxonomy announced by the Ministry of Education and Sports, Lao PDR, must be addressed in the building of the new curricula. Finally, they ought to give students easier access to and more learning resources for them to use.

III. RESEARCH METHODOLOGY

The present study concerns the evaluation of the ESP materials used in aforementioned LPDR university in terms of content and exercises, topics, skills and strategies, and teaching methodology and attempts to shed light on the strengths and weaknesses of their ESP textbooks. Therefore, it has sought to answer the following research questions:

(i) What is the learner’s attitude toward the current ESP materials used in the bachelor's program of Applied Linguistics at this institution?
(ii) What topics do students expect to learn the most from ESP materials?
(iii) What changes could be made to the ESP materials to better meet the needs of the learners?

A group of 100 undergraduates both male and female, who are doing ESP courses in the university, were invited to provide their opinions of the in-use ESP materials. The majority of the participants have English proficiency at between B1 and B2 level and wish to work as EFL teachers, translators, interpreters, tour guides, officials, or other English language-related professions. Mixed questionnaires were employed in the study as the primary research instrument collecting information of the participants’ background, their evaluation of the current ESP materials and their expectations of the proposed documents for the ESP courses. The second part is a closed questionnaire using a five-point Likert scale of agreement, where 1 = strongly agree, 2 = agree, 3 = moderate, 4 = disagree, and 5 = strongly disagree. The open-ended questions in section 3 targeted students' recommendations for the proposed changes of the ESP materials. With the use of mixed methods, the study has shown more features of an exploratory research design including quantitative components aiming to analyze students’ viewpoint on current ESP materials, and topics they wish to learn their ESP courses, and qualitative approach seeking to explore students’ recommendations for the proposed changes of new ESP materials.

IV. FINDINGS AND DISCUSSION

Regarding the learner’s attitudes toward the current ESP materials used in the bachelor's program of Applied Linguistics at the aforementioned Lao university, the result shows that the participants generally agreed with the appropriateness of the layout and design, book objective, language skills, and content of the materials while the availability of the materials, the exercises and activities were not very well acknowledged.

As illustrated in Table 1, there was a consensus among the learners that the design was attractive and consistent and the details of material structures and table contents were adequately provided. In addition, the objectives of the materials were suitably communicated in that they were related to the students’ needs and points out clear goals for students’ learning. The participants also agreed that they had opportunities to practice the 4 language skills in those in-house ESP materials. Other aspects including the provision of exercises, the access to technical vocabulary and relevant grammar points and general appearance were considered moderately sufficient.

Nevertheless, negative feedback was given on materials availability. To be more specific, the English majors were dissatisfied with the provision of the ESP materials either in the library or online, which lead to their poor overall evaluation of the availability of the materials.

<table>
<thead>
<tr>
<th>Students’ perceptions of current ESP materials</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N</th>
<th>Mean</th>
<th>S.D</th>
<th>Level of agreement</th>
</tr>
</thead>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The outside cover is attractive</td>
<td>6</td>
<td>31</td>
<td>52</td>
<td>8</td>
<td>3</td>
<td>100</td>
<td>3.29</td>
<td>0.82</td>
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</tr>
<tr>
<td>The font size used in the book is appropriate</td>
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<td>41</td>
<td>34</td>
<td>11</td>
<td>0</td>
<td>100</td>
<td>3.58</td>
<td>0.86</td>
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</tr>
<tr>
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<td>17</td>
<td>40</td>
<td>34</td>
<td>9</td>
<td>0</td>
<td>100</td>
<td>3.65</td>
<td>0.86</td>
<td>Agree</td>
</tr>
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<td></td>
<td></td>
<td></td>
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<td>0.85</td>
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<td>40</td>
<td>9</td>
<td>1</td>
<td>100</td>
<td>3.55</td>
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</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>---</td>
<td>---</td>
<td>-----</td>
<td>------</td>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>There is a variety of designs to achieve the impression</td>
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<td>32</td>
<td>38</td>
<td>12</td>
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<td>100</td>
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<td>0.92</td>
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</tr>
<tr>
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<td>37</td>
<td>34</td>
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<td>The textbook includes a detailed overview of the functions and structures that will be taught in each unit</td>
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<td>30</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Total</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.66</td>
<td>0.90</td>
<td>Agree</td>
</tr>
<tr>
<td>Book objectives</td>
<td>16</td>
<td>40</td>
<td>37</td>
<td>7</td>
<td>0</td>
<td>100</td>
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<td>0.83</td>
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<td>44</td>
<td>34</td>
<td>7</td>
<td>1</td>
<td>100</td>
<td>3.63</td>
<td>0.84</td>
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</tr>
<tr>
<td>The textbook raises students' interest in further English language study</td>
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<td>30</td>
<td>37</td>
<td>12</td>
<td>1</td>
<td>100</td>
<td>3.56</td>
<td>0.97</td>
<td>Agree</td>
</tr>
<tr>
<td>Total</td>
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<td>0.88</td>
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<td>45</td>
<td>32</td>
<td>8</td>
<td>2</td>
<td>100</td>
<td>3.59</td>
<td>0.88</td>
<td>Agree</td>
</tr>
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<td>3</td>
<td>36</td>
<td>49</td>
<td>8</td>
<td>4</td>
<td>100</td>
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</tr>
<tr>
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<td>3</td>
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<td>0.76</td>
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<tr>
<td>The exercises in the textbook are relevant to the student’s interests</td>
<td>3</td>
<td>36</td>
<td>46</td>
<td>11</td>
<td>4</td>
<td>100</td>
<td>3.23</td>
<td>0.83</td>
<td>Moderate</td>
</tr>
<tr>
<td>The exercises allow students to practice more than teachers and allow students to use English outside the school</td>
<td>8</td>
<td>27</td>
<td>47</td>
<td>13</td>
<td>5</td>
<td>100</td>
<td>3.20</td>
<td>0.94</td>
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</tr>
<tr>
<td>Total</td>
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<td></td>
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<td></td>
<td>3.20</td>
<td>0.09</td>
<td>Moderate</td>
</tr>
<tr>
<td>The materials suggest a variety of activities (pair work, whole class, group work, etc)</td>
<td>12</td>
<td>44</td>
<td>35</td>
<td>9</td>
<td>0</td>
<td>100</td>
<td>3.59</td>
<td>0.81</td>
<td>Agree</td>
</tr>
<tr>
<td>Activities provided in the textbook are interesting, relevant and effectiveness</td>
<td>16</td>
<td>29</td>
<td>39</td>
<td>13</td>
<td>3</td>
<td>100</td>
<td>3.42</td>
<td>1.00</td>
<td>Moderate</td>
</tr>
<tr>
<td>The textbook provides outside-class activities</td>
<td>13</td>
<td>37</td>
<td>39</td>
<td>10</td>
<td>1</td>
<td>100</td>
<td>3.51</td>
<td>0.88</td>
<td>Agree</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3.51</td>
<td>0.90</td>
<td>Moderate</td>
</tr>
<tr>
<td>The four language skills</td>
<td>20</td>
<td>41</td>
<td>32</td>
<td>6</td>
<td>1</td>
<td>100</td>
<td>3.73</td>
<td>0.88</td>
<td>Agree</td>
</tr>
<tr>
<td>The reading tasks are appropriate for improving students’ reading skills.</td>
<td>19</td>
<td>39</td>
<td>37</td>
<td>5</td>
<td>0</td>
<td>100</td>
<td>3.72</td>
<td>0.83</td>
<td>Agree</td>
</tr>
<tr>
<td>The writing tasks are appropriate for improving students’ writing skills.</td>
<td>19</td>
<td>36</td>
<td>33</td>
<td>11</td>
<td>1</td>
<td>100</td>
<td>3.61</td>
<td>0.95</td>
<td>Agree</td>
</tr>
<tr>
<td>The writing tasks are suitable in terms of accuracy.</td>
<td>12</td>
<td>29</td>
<td>51</td>
<td>8</td>
<td>0</td>
<td>100</td>
<td>3.45</td>
<td>0.80</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
The materials offer a great range of listening texts. | 21 | 27 | 43 | 9 | 0 | 100 | 3.60 | 0.92 | Agree
Textbook activities can help students acquire a range of listening skills. | 17 | 36 | 37 | 10 | 0 | 100 | 3.60 | 0.88 | Agree
The speaking tasks are appropriate for improving students’ speaking skills. | 22 | 41 | 31 | 5 | 1 | 100 | 3.78 | 0.88 | Agree
There are adequate materials for spoken English (e.g. dialogues, role-plays, etc.). | 9 | 32 | 40 | 17 | 2 | 100 | 3.29 | 0.92 | Moderate

Vocabulary and grammatical components

<table>
<thead>
<tr>
<th>Items</th>
<th>N</th>
<th>S.D</th>
<th>Level of agreement</th>
</tr>
</thead>
</table>
The vocabulary items are appropriate for the student’s level. | 14 | 30 | 38 | 16 | 2 | 100 | 3.38 | 0.98 | Moderate
The main grammar items the textbook covers are appropriate for the student’s level. | 9 | 35 | 39 | 15 | 2 | 100 | 3.34 | 0.91 | Moderate
The grammatical structures are presented inductively. | 13 | 33 | 44 | 9 | 1 | 100 | 3.48 | 0.87 | Moderate
The materials for teaching grammar, vocabulary, and pronunciation are graded in a suitable manner. | 14 | 37 | 33 | 13 | 3 | 100 | 3.46 | 0.98 | Moderate

Materials availability

<table>
<thead>
<tr>
<th>Items</th>
<th>N</th>
<th>S.D</th>
<th>Level of agreement</th>
</tr>
</thead>
</table>
There are materials needed in the library | 0 | 1 | 18 | 64 | 17 | 100 | 2.03 | 0.62 | Disagree
There is an online version of the materials | 0 | 8 | 42 | 33 | 17 | 100 | 2.41 | 0.86 | Disagree
I am satisfied with the materials | 0 | 6 | 41 | 36 | 17 | 100 | 2.36 | 0.83 | Disagree

The students’ needs for language skills practice embedded in the ESP materials were demonstrated in Table 2. As indicated in the survey results, all the 4 English skills were regarded as significant and writing was the skill that students expected to learn the most. They wanted to learn how to write academic reports, essays, journal papers, emails, CVs, taking notes as well as writing a paper for an oral presentation. Speaking skill comes in second place in reference to students’ needs for language skills practice. The participants strongly agreed that they should be engaged in in-class and out-of-class English activities; moreover, they expected to get access to professional conversations, seminars, meetings and presentations in authentic contexts. The receptive skills received lower mean scores but were still of importance in that they were supposed to be involved in meaningful reading and listening activities.

<table>
<thead>
<tr>
<th>Table 2. Needs in skills practice</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Items</strong></td>
</tr>
<tr>
<td>Needs in speaking skill</td>
</tr>
<tr>
<td>Talking with a professional in a real situation</td>
</tr>
<tr>
<td>Speaking at seminars, meetings, and presentation</td>
</tr>
<tr>
<td>Asking and answering in class/outside class</td>
</tr>
<tr>
<td>Participating in academic discussions</td>
</tr>
<tr>
<td>Need in reading skill</td>
</tr>
<tr>
<td>Reading articles in professional journals</td>
</tr>
<tr>
<td>Reading texts on the internet, books…</td>
</tr>
<tr>
<td>Reading academic reports</td>
</tr>
<tr>
<td>Reading specializes literature</td>
</tr>
<tr>
<td>Needs in writing skill</td>
</tr>
</tbody>
</table>
Participants’ suggestions for the changes of the proposed ESP materials used in the bachelor's program of Applied Linguistics at the mentioned university were collected and displayed in the following table.

<table>
<thead>
<tr>
<th>The items</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>Mean</th>
<th>N</th>
<th>S.D</th>
<th>Level of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The general appearance of the materials</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The University should provide new ESP materials with interesting, and attractive cover page</td>
<td>14</td>
<td>69</td>
<td>16</td>
<td>1</td>
<td>0</td>
<td>3.96</td>
<td>0.58</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>The university should design up-to-date materials for the students</td>
<td>65</td>
<td>21</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>4.51</td>
<td>0.73</td>
<td>strongly agree</td>
<td></td>
</tr>
<tr>
<td><strong>Book objectives</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The objective of the textbooks should be related to the student’s needs</td>
<td>12</td>
<td>52</td>
<td>28</td>
<td>8</td>
<td>0</td>
<td>3.68</td>
<td>0.79</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>New materials should cover a variety of topics of business, banking, meeting, working in the office, tourism industry…</td>
<td>70</td>
<td>25</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>4.65</td>
<td>0.57</td>
<td>strongly agree</td>
<td></td>
</tr>
<tr>
<td><strong>Activities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The textbook allows students to practice a lot of speaking both inside and outside class (phone call, role play, debate, presentation…)</td>
<td>70</td>
<td>20</td>
<td>9</td>
<td>1</td>
<td>0</td>
<td>4.59</td>
<td>0.69</td>
<td>strongly agree</td>
<td></td>
</tr>
<tr>
<td>The textbook provides a lot of inside and outside class activities</td>
<td>19</td>
<td>59</td>
<td>19</td>
<td>3</td>
<td>0</td>
<td>3.94</td>
<td>0.70</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>The new textbook provides interesting, relevant &amp; effective activities for the students</td>
<td>19</td>
<td>52</td>
<td>28</td>
<td>1</td>
<td>0</td>
<td>3.89</td>
<td>0.71</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>Activities are developed to encourage students’ oral communication and become more confident English speaker</td>
<td>28</td>
<td>40</td>
<td>32</td>
<td>0</td>
<td>0</td>
<td>3.96</td>
<td>0.77</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>Activities are balanced between individual response, pair work, and group work</td>
<td>26</td>
<td>48</td>
<td>24</td>
<td>2</td>
<td>0</td>
<td>3.98</td>
<td>0.76</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td>The textbook allows students to do the real projects</td>
<td>72</td>
<td>18</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>4.62</td>
<td>0.66</td>
<td>strongly agree</td>
<td></td>
</tr>
<tr>
<td><strong>Exercises</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The number of exercises in each unit is relevant</td>
<td>17</td>
<td>52</td>
<td>31</td>
<td>0</td>
<td>0</td>
<td>3.86</td>
<td>0.68</td>
<td>agree</td>
<td></td>
</tr>
<tr>
<td><strong>Language skills</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Textbooks provide good communication skills</td>
<td>65</td>
<td>25</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>4.55</td>
<td>0.67</td>
<td>strongly agree</td>
<td></td>
</tr>
<tr>
<td>The new textbook provides writing skills (writing reports, writing essays, writing emails, writing journals …)</td>
<td>31</td>
<td>49</td>
<td>17</td>
<td>3</td>
<td>0</td>
<td>4.08</td>
<td>0.77</td>
<td>agree</td>
<td></td>
</tr>
</tbody>
</table>
The new textbook provides reading skills (skimming, scanning…) 29 48 23 0 0 4.06 0.72 agree
The textbook provides listening skills (telephone conversation, international conferences, company negotiation…) 29 37 30 4 0 3.91 0.86 agree

Vocabulary and grammar
The textbook covers the appropriate grammar (verb, tenses, part of speech, subject-verb – agreement …) 23 54 20 3 0 3.97 0.74 agree
Textbooks provide specialized vocabulary in terms of a variety of topics of business, banking, meeting, working in the office, tourism industry… 24 50 25 1 0 3.97 0.73 agree

Materials availability
The university allows students to get into the textbook easily both online and offline in the library 28 46 24 2 0 4.00 0.77 agree

| Total | 4.12 | 0.72 | agree |

The data show that the students expected to have new ESP materials, which cover a wide range of business, banking, meeting, office job, and tourism-related topics. They noted that they preferred the so-called textbooks with plenty of opportunities for students to work on actual projects and practice speaking both inside and outside the classroom, such as during role-playing activities, debates, presentations, and other speaking circumstances. They accordingly expressed their strong support for the new ESP materials if they could provide them with current tools and productive communication skills. Moreover, the English majors recommended that the language skills task cover a wide range of text genres and profession-related topics, which shares a lot of similarities in their requests for language knowledge components. Table 3 also indicates learners’ high expectations of the learning activities to be conducted in ESP courses. In particular, they highlighted that the textbook should allow more communication practice both inside and outside class and more balanced individual, pair and group work activities and projects. It is noteworthy to mention that students insist on the availability of the materials in the university library.

It is obvious that the aforementioned university has made a great effort to meet learners’ needs in the English academic learning resources. Students’ overall satisfaction of the layout and design, book objective, language skills, and content of the materials indicates the university’s attempt to provide their learners with relevant and comprehensive learning materials. However, there exists some negative feedback on materials availability as well as the range of activities included in the materials.

A number of recommendations on the changes of the ESP materials were introduced for more need-based design of the materials, which were in parallel with the discussion of Harding (2007) and McDonough and Shaw (2003). The former author suggested that ESP teachers ought to use texts, scenarios, and circumstances related to the students’ subject matters and thus they will automatically incorporate the terminology that the students require, whether they are simulated or real. Additionally, he recommended that teachers make use of the real-world materials that students utilize in their chosen professions or fields and not be put off by the idea that they might not sound like standard English. Similarly the later authors proposed that the content of a textbook should be directed at a particular audience, and textbook materials should address such specific audiences in terms of their needs.

V. CONCLUSION
The study is an attempt for a need-based evaluation of the ESP materials used in a LPDR university. Findings have shown that there should be more critical considerations of the learners’ perspectives in the design and implementation of the learning materials. It is suggested that university propose procedures for their material development in which students’ engagement before, during and after the implementation should be included.

REFERENCES


**AUTHORS**

**First Author** – Nguyen Thi Hong Minh, Thai Nguyen University of Education (Vietnam), minhnth@tnue.edu.vn  
**Second Author** – Sonephet Keoduangsavaht, Savannakhet University (Laos), skuphet2014@gmail.com

**Correspondence Author** – Nguyen Thi Hong Minh, Thai Nguyen University of Education (Vietnam), minhnth@tnue.edu.vn,  
+849813114299
Innovation for Empowering Activated Charcoal Tea Using Hyacinth, Husk, Moringa Leaves as Chemical Absorbents

Lenie Marlinae*, Anugrah Nur Rahmat*, Taufik**

*Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat  
**Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

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Paper Acceptance Date: 30th October 2022  
Paper Publication Date: 14th November 2022

Abstract- The cause of Banjar Regency frequent flooding is because the low location of Banjar Regency from above sea level causes the flow of water on the ground surface to be hampered. As a result, some areas are always inundated (29.93%) while others (0.58%) are periodically inundated. Areas that are categorized as prone to periodic flooding are on a slope. This area consists of Sungai Pinang, Mataraman, Astambul, Gambut, Aranio, and Pengaron sub-districts. The area affected by the flood is estimated to be 104.53 hectares or a potential flood of 23.31. The Astambul area has a lot of waste and plants that can be used as absorbents to improve physical, chemical and bacteriological qualities by adsorption of gases and certain chemical compounds or their selective adsorption properties, depending on the size or volume of pores and surface area because the absorption of activated carbon is very large, which is 25-1000% by weight of activated carbon. Activated carbon is often used to reduce organic contaminants, synthetic organic chemical particles, but activated carbon is also effective for reducing inorganic contaminants such as radon, mercury and other toxic metals. Community empowerment in the health sector carried out in the treatment of clean water in the Astambul sub-district is carried out in order to meet the physical, chemical, bacteriological qualities, namely by filtration and adsorption methods can use natural materials that grow such as water hyacinth and Moringa and the rest of community activities around the community such as coconut fiber, shells coconut by making absorbent pads due to waste and plants because it contains nine amino acids, sucrose, D-glucose, alkaloids, waxes, quercetin and kaempferate are also rich in potassium and calcium. Moringa leaves contain vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins, saponins, and oxalates.

Index Terms- Activated Charcoal, Moringa Leaf, Water Hyacinth, Husk

I. INTRODUCTION

According to WHO, each person needs between 60-120 liters of water/day, while in developing countries, including Indonesia, each person needs between 30-60 liters of water/day. Many problems with the quality of groundwater and well water do not meet the requirements so that the water that is not suitable for consumption by the community can have an adverse impact on the health of the community. Clean water according to Permenkes 32 of 2017 must comply with quality standards or good quality standards including physical (color, odor, taste, temperature, and turbidity), chemical (pH, Fe, Mn), microbiology (1).

Riskesdas 2018 data shows that the proportion of clean water usage < 20 l/person/day is 2.2%, meaning that in Indonesia there are still 2.2% where access to clean water is very lacking and minimal. Data for South Kalimantan with very poor access is about 3% and for Banjar Regency as much as 2.41% with details < 5 liters 0.43% meaning that access is very low, the health risk is very high, 5-19.9% as much as 1.98 l/ people/day means less access, high health risk. The use of good quality water can have an impact on health in the short and long term. Poor quality water will have short-term health impacts in the form of vomiting, diarrhea, cholera, typhoid or dysentery and stunting. Health impacts that may arise in the long term due to poor quality water are bone loss, tooth corrosion, anemia, and kidney damage. This happens because the water is contaminated by heavy metals which are usually toxic and precipitate in the kidneys. Data on diarrhea cases were 170 cases in Banjar Regency and 248 cases of stunting in 5 villages in Astambul District (1, 2).

Efforts are being made to overcome the problem of the availability of clean water by empowering the community by using natural materials found in the area which are cheap and able to improve in quality and quantity. Community empowerment in the health sector carried out in the treatment of clean water in the Astambul sub-district is carried out in order to meet the physical, chemical, bacteriological qualities, namely by...
Evaluation of extension activities in the form of pre-test and post-test showed an increase in the average value of correct answers from respondents after being given counseling and demonstration of clean water treatment. This means that there is absorption of knowledge conveyed at the time the counseling takes place.

Based on table 5.1 the level of initial knowledge about clean water in most of the community is quite good, reaching an average of 4, this can be due to socialization about clean water obtained from media such as television or other media. The results of the post-test there is an increase in knowledge in the community which can be seen from the average value of all respondents. Especially on knowledge about the impact of dirty water, efforts to improve water conditions and natural materials that can be used to purify water which have increased the number of correct answers are quite large.

The lecture and discussion methods are quite effective in delivering counseling materials to the public by displaying enough pictures rather than writing to attract attention. Coupled with direct practice regarding the material presented, it will be easier for the public to remember the information obtained. One of the media that can be used to facilitate outreach activities is lectures.

The development of public health is a joint task that cannot be done by medical personnel alone, the participation of the community is also needed considering the vast territory of Indonesia. Empowering the community can be an extension of health agencies such as health centers to assist in community health development efforts. Counseling and training to the community should be carried out on an ongoing basis because the sources of information obtained by other media are still quite limited. The results of outreach activities on water treatment materials to the community showed positive results in the form of better post-test scores than pre-tests based on the table,

IV. CONCLUSION

The results of the extension activities have a positive impact on the community where it is seen that there is an increase in public knowledge between before and after being given counseling. Counseling is more effective because the material delivered is directly practiced so that the information obtained is easier to remember and accepted by the community. Empowering the
community to be able to treat clean water by utilizing local natural resources, such as rice husks, water hyacinth and coconut shells. The participation of the government and local health facilities is also needed in supporting clean water treatment and facilitating its activities.

REFERENCES
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AUTHORS
First Author – Lenie Marlinae, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Second Author – Anugrah Nur Rahmat, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Third Author – Taufik, Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Correspondence Author – Lenie Marlinae, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Potential Utilization of Waste and Local Plants as Absorbents of Fe and Mn in Dug Well Water


*Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
**Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

Abstract-Water is the main need in life so that every living thing can grow and develop properly on earth. Riskesdas 2018 data shows that the proportion of clean water usage < 20 l/person/day is 2.2%, meaning that in Indonesia there are still 2.2% where access to clean water is very lacking and minimal. Data for South Kalimantan with very poor access is about 3% and for Banjar Regency as much as 2.41% with details < 5 liters 0.43% meaning that access is very low, the health risk is very high, 5-19.9% as much as 1.98 l/people/day means less access, high health risk. The potential of plants and waste resulting from seasonal community activities in the environment can be used as activated carbon such as charcoal and ash, which can adsorb certain gases and chemical compounds or have selective adsorption properties, depending on the size or volume of pores and surface area because the adsorption capacity of activated carbon is very large, which is 25-1000% by weight of activated carbon. Activated carbon is often used to reduce organic contaminants, synthetic organic chemical particles, but activated carbon is also effective for reducing inorganic contaminants such as radon, mercury, iron, manganese and other toxic metals. So it is necessary to treat clean water in the Astambul sub-district in order to fulfill the physical, chemical, bacteriological quality, namely by filtration and adsorption methods can use natural materials that grow such as water hyacinth and moringa and the rest of community activities around the community such as rice straw, husks, coconut fibers, coconut shells, market charcoal. The active ingredient content in water hyacinth consists of 60% cellulose, 8% hemicellulose, and 17% lignin. , fat 1.33%. Moringa leaves contain vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins, saponins, and oxalates. The active ingredients in these local ingredients are useful for filtering water from impurities and helping in overcoming pollutants in the water so that the water becomes clear. Astambul sub-district has several weaknesses, namely the availability of clean water is lacking, and the quality of surface water does not meet the requirements as clean water both physically, chemically and bacteriologically. The strength it has is the availability of locally available resource materials such as rice straw, husks, coconut fibers, coconut shells, market charcoal. Opportunities that are owned are local resources available in abundance and easy to obtain. Then the threat that is owned is that there are local resources that are not durable, so they must be managed immediately. The cause of Banjar Regency frequent flooding is because the low location of Banjar Regency from above sea level causes the flow of water on the ground surface to be hampered. As a result, some areas are always inundated (29.93%) while others (0.58%) are periodically inundated (2). According to Rahman in 2017, areas that are categorized as highly prone to flooding are routinely located on slopes of 0 - 8% with an average annual rainfall of 18.69 - 21.5 mm/day. This area consists of sub-districts in Banjar Regency, one of which is Astambul (3). The proposal of this research is to test
the potential of clean water treatment made from local materials to improve the quality and quantity of Fe and Mn in clean water in post-flood fulfillment.

II. RESEARCH METHODS

The instruments that will be used in this research are in the form of filling sheets, and questionnaires and water testing laboratory equipment. Carry out absorption activities with physical media and waste consisting of coconut shells, straw, husks, Moringa leaves, water hyacinth.

III. RESULTS AND DISCUSSION

Table 1 Soil Test Results in Astambul District in 6 villages (Kelampian Tengah, Kelampapan Ulu, Lok Gabang, Sungai Alat and Kaliukan)

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Soil Organic Carbon (%)</th>
<th>Organic Ingredients (%)</th>
<th>Mn-soluble (PPM)</th>
<th>Fe-soluble (PPM)</th>
<th>Permeability (cm/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Kelampian Village</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1 point</td>
<td>2.09</td>
<td>3.6</td>
<td>14</td>
<td>57.38</td>
<td>7.64</td>
</tr>
<tr>
<td>2</td>
<td>Point 2</td>
<td>1.38</td>
<td>2.41</td>
<td>3.91</td>
<td>12.68</td>
<td>3.36</td>
</tr>
<tr>
<td>3</td>
<td>3 point</td>
<td>1.25</td>
<td>2.17</td>
<td>4.48</td>
<td>13.61</td>
<td>2.3</td>
</tr>
<tr>
<td>4</td>
<td>4 point</td>
<td>0.69</td>
<td>1.2</td>
<td>3.62</td>
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<td>1.45</td>
<td>2.76</td>
<td>19.82</td>
<td>2.57</td>
</tr>
</tbody>
</table>
Soil sample testing in 5 villages of Astambul District was seen based on 6 indicators, namely organic carbon, organic matter, water content, soluble Mn, soluble Fe and permeability. The average value of soil organic carbon from all sampling points is 1.09%. The highest value is at point 3 in Kelampapan Ulu Village at 2.14% and the lowest at point 2 in Lok Gabang Village at 0.41%. The average value of organic matter for all points of collection was 1.9%. The village with the highest average score is Kelampapan Ulu Village at 2.75% and the highest point is at point 3 Kelampapan Ulu Village at 3.73%. The water content in the soil for all points has an average of 21.03%. Kaliukan Village has the highest average water content of 26.85% and the point with the highest water content is also found in Kaliukan Village at point 1 of 34.56%. The average soluble Mn content for all points was 4.73ppm. Villages with the highest average soluble Mn content were found in Sungai Alat Village at 11.10 ppm and the point with soluble Mn levels was at point 5 in Sungai Alat Village at 49.14 ppm. The average soluble Fe content for all points was 52.69ppm. The village with the highest soluble Fe content was found in Sungai Alat Village at 218.22 ppm and the point with the highest soluble Fe content was also found in Sungai Alat village point 5 at 1217.94 ppm. The average soil permeability from all points is 2.47cm/hour. The village with the highest average level of soil permeability is in Sungai Alat Village of 2.94cm/hour and the highest point of soil permeability is at point 1 in Sungai Alat Village of 4.54 cm/hour.

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Organic Carbon (%)</th>
<th>Organic Ingredients (%)</th>
<th>Mn-soluble (PPM)</th>
<th>Fe-soluble (PPM)</th>
<th>Permeability (cm/hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
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<td>23.8</td>
<td>48.84</td>
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<td>3.12</td>
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</tr>
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<td>2.66</td>
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<td>3.13</td>
<td>17.46</td>
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</tr>
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<td>3.67</td>
<td>12.92</td>
<td>1.94</td>
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<tr>
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<td>1.69</td>
<td>2.93</td>
<td>6.72</td>
<td>18.75</td>
<td>2.73</td>
</tr>
</tbody>
</table>

Soil organic carbon (C) is a fundamental component in the global carbon cycle to support the sustainability of terrestrial ecosystems. Soil C-organic is formed through several stages of organic matter decomposition. Soil C-organic status is influenced by various external factors such as soil type, rainfall, temperature, input of organic matter from above-soil biomass, anthropogenic processes, soil management activities, and CO2 content in the atmosphere Changes in soil C-organic status through the process of decomposition and

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http://dx.doi.org/10.29322/IJSRP.12.11.2022.p13119

www.ijsrp.org
Mineralization of soil organic matter is reported to be related to soil properties such as texture, pH, metal cations in the soil, CEC (cation exchange capacity), and nitrogen content (4).

Organic matter can be defined as all materials derived from plant and animal tissues, both living and dead. Soil organic matter is a complex and dynamic material, derived from the remains of plants and animals in the soil and undergoing continuous degradation. Soil organic matter is formed from living soil organisms consisting of flora and fauna, living and dead plant roots, which are decomposed and modified as well as new synthesis products derived from plants and animals. Soil organic matter plays an important role in determining the physical, chemical, and biological activities in the soil that determine the carrying capacity and productivity of the land. Organic matter is generally found on the soil surface in the amount of only 3-5% (5).

Organic matter is a complex and dynamic system, sourced from plant or animal residues found in the soil that continuously changes shape, because it is influenced by physical, biological, and chemical factors. Reintjes et al., (1992 in Nangaro) suggested that the function of soil organic matter, among others, is to store nutrients which are slowly released into the groundwater solution and made available to plants. Organic matter in or above the soil also protects and helps regulate soil temperature and humidity. Organic matter can also increase soil support (5).

The results showed that degraded paddy fields were one of the indications due to low organic matter and potassium. Organic matter has an important role in determining the ability of the soil to support plants, so that if the level of soil organic matter decreases, the ability of the soil to support plant productivity also decreases (6).

The C-Organic content of the soil can be low because the absence of the use of organic fertilizers in a field is the main factor in the low C-organic content of the soil. The land only uses inorganic fertilizers to increase soil fertility (7).

Soil water content is the ability of the soil to bind water which is influenced by matrix, osmotic and capillary binding forces. These forces are caused by the attraction between soil particles to one another and is also influenced by the electrostatic charge density of the soil particles. The disturbance and changes in volume weight, soil pore volume and pore size distribution cause variations in water content in the soil. The value of water content can be obtained by gravimetric method, namely the weight of the initial wet soil with the weight of the oven dry soil (8).

### Table 3. Results of inspection of the physical quality of clean water in Astambul District in 5 villages (Kelampian Tengah, Kelampakan Ulu, Lok Gabang, Sungai Alat and Kaliukan)

<table>
<thead>
<tr>
<th>Physique</th>
<th>Temperature (Maximum Level=Air Temperature ±3)</th>
<th>DO (Minimum Level 6)</th>
<th>TDS (Maximum Level=1000)</th>
<th>Turbidity (Maximum Level=25)</th>
</tr>
</thead>
<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1 point</td>
<td>35.5</td>
<td>in accordance</td>
<td>7.5</td>
</tr>
<tr>
<td>2</td>
<td>Point 2</td>
<td>28</td>
<td>in accordance</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3 point</td>
<td>27</td>
<td>in accordance</td>
<td>3.5</td>
</tr>
<tr>
<td>4</td>
<td>4 point</td>
<td>28</td>
<td>in accordance</td>
<td>2.2</td>
</tr>
<tr>
<td>5</td>
<td>5 point</td>
<td>27</td>
<td>in accordance</td>
<td>8.1</td>
</tr>
<tr>
<td>Average</td>
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<td>in accordance</td>
<td>5.06</td>
<td>in accordance</td>
</tr>
<tr>
<td>Lok Gabang Village</td>
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<td></td>
</tr>
<tr>
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<td>1 point</td>
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<td>in accordance</td>
<td>1.8</td>
</tr>
<tr>
<td>7</td>
<td>Point 2</td>
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<td>in accordance</td>
<td>5.6</td>
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<td>8</td>
<td>3 point</td>
<td>27</td>
<td>in accordance</td>
<td>20</td>
</tr>
<tr>
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<td>Sample</td>
<td>Physique</td>
<td>Temperature (Maximum Level=Air Temperature ±3)</td>
<td>DO (Minimum Level 6)</td>
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<td>----------</td>
<td>-----------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>9</td>
<td>4 point</td>
<td>28</td>
<td>in accordance</td>
<td>14.4 in accordance</td>
</tr>
<tr>
<td>10</td>
<td>5 point</td>
<td>28</td>
<td>in accordance</td>
<td>3.8 in accordance</td>
</tr>
<tr>
<td>11</td>
<td>6 point</td>
<td>27</td>
<td>in accordance</td>
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</tr>
<tr>
<td></td>
<td>Average</td>
<td></td>
<td></td>
<td>8.40 in accordance</td>
</tr>
</tbody>
</table>

**Tool River Village**

| 12 | 1 point | 30.3 | in accordance | 1.4 | 162 in accordance | 6 in accordance |
| 13 | Point 2 | 28   | in accordance | 5.5 | 159 in accordance | 30.7 in accordance |
| 14 | 3 point | 27   | in accordance | 6.1 | 158 in accordance | 49.5 in accordance |
| 15 | 4 point | 27   | in accordance | 6.2 | 231 in accordance | 20.7 in accordance |
| 16 | 5 point | 27   | in accordance | 6.7 | 105 in accordance | 6.43 in accordance |
| 17 | 6 point | 27   | in accordance | 32.1| 258 in accordance | 33.0 in accordance |
| 18 | 7 point | 29   | in accordance | 2.6 | 86 in accordance  | 5.16 in accordance |
|    | Average | 27.9 | in accordance | 8.66| 165.5 in accordance | 21.6 in accordance |

**Kaliukan Village**

| 19 | 1 point | 35.9 | it is not in accordance with | 5.3 | 339 in accordance | 6.08 in accordance |
| 20 | Point 2 | 28   | in accordance | 31  | 119 in accordance | 30.1 in accordance |
| 21 | 3 point | 27   | in accordance | 8.4 | 177 in accordance | 23.3 in accordance |
| 22 | 4 point | 28   | in accordance | 4.3 | 87 in accordance  | 4.31 in accordance |
| 23 | 5 point | 27   | in accordance | 8.1 | 71 in accordance  | 17.0 in accordance |
| 24 | 6 point | 27   | in accordance | 19.2| 93 in accordance  | 21.8 in accordance |
The results of testing water samples at 30 points spread across Astambul District found that the water temperature was suitable for sanitation hygiene purposes according to the Minister of Health Regulation Number 32 of 2017. However, there were 4 points (13.33%) which had water temperatures below the standard of the regulations in the village. Kelampapan Tengah, Kaliukan Village and Kelampapan Ulu Village.

The temperature of the water is very dependent on the place where the water is located. The increase in water temperature in water bodies, waterways, rivers, lakes and so on will have consequences in the form of 1) The amount of dissolved oxygen in the water decreases; 2) The speed of chemical reactions increases; 3) The life of fish and other aquatic animals is disturbed (9). Water temperature that exceeds normal limits indicates that there are dissolved chemicals in large enough quantities (eg phenol or sulfur) or that the process of decomposition of organic matter by microorganisms is taking place. If the condition of the water is like that then the water is said to be unfit for drinking and can interfere with health (10).

Dissolved Oxygen (DO) testing on water samples in Astambul District obtained an average of 8.03 mg/l and is in accordance with the water used for sanitation hygiene needs. At some points, the number of DO is still below the standard, namely 16 points (53.3%) and spread over 6 villages (Kelampian Tengah, Kelampapan Ulu, Lok Gabang, Sungai Alat, and Kaliukan).

Dissolved Oxygen (DO) is the amount of oxygen dissolved in a certain volume of water at a certain temperature and pressure. DO in water is needed to support the life of the organisms in it (Saksena et al., 2008). The main source of DO is photosynthesis, besides river characteristics also affect the presence of DO. The characteristic of the river which is relatively flat shows a flow pattern that is relatively calm and there is no turbulence which will reduce the process of re-aeration of air into the water so that the process of diffusion of oxygen into the river water is not optimal (11).

c) TDS (Total Dissolved Solid)
The average value of Total Dissolved Solid (TDS) obtained is 179.27 mg/l and is in accordance with the water requirements used for sanitation hygiene needs according to the Minister of Health Regulation No. 32 of 2017. There were no sampling points that had the amount of TDS exceeding the maximum threshold.

Total Dissolved Solids (TDS) are dissolved materials (10-6mm diameter) and colloids (10-6mm-10-3mm diameter) in the form of chemical compounds and other materials that are not filtered on filter paper. 0.45 m in diameter (12).

d) Turbidity
The results of the turbidity level test obtained an average of 17.23NTU. This figure is below the maximum threshold for water used as sanitation hygiene so that in terms of turbidity it still meets the standard. However, there are 8 points (26.67%) which have a high level of turbidity or above 25NTU so that it does not meet the feasibility of water used for sanitation hygiene according to Minister of Health Regulation No. 32 of 2017.

The turbidity value indicates that the river water is not suitable for consumption. The turbidity of river water is caused by the amount of material suspended in the river water, such as soil, mud and other organic materials. Suspended sediment from land is carried by surface runoff when it rains (13).

1) Chemical testing
Sampling of water for chemical testing at 30 points spread over 5 villages in the Astambul District, the results can be seen in the following table.

Table 4: The results of the chemical quality inspection of clean water in Astambul District in 5 villages (Kelampian Tengah, Kelampapan Ulu, Lok Gabang, Sungai Alat and Kaliukan)

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Chemical</th>
<th>pH (Recommended Level=6.5-8.5)</th>
<th>Iron (Maximum Level=1mg/l)</th>
<th>Manganese (Maximum Level=0.5mg/l)</th>
<th>Lead (Maximum Level=0.05mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Kelampian Village</td>
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<td>3</td>
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<td>25</td>
<td>in accordance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5</td>
<td>it is not in accordance with</td>
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<td>28.98</td>
<td>in accordance</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>6.34</td>
<td>it is not in accordance with</td>
<td>0.84</td>
<td>23.08</td>
<td>34.18</td>
</tr>
<tr>
<td>Lok Gabang Village</td>
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<td></td>
</tr>
<tr>
<td>6</td>
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<td>2</td>
<td>it is not in accordance with</td>
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<td>25</td>
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<td></td>
<td></td>
<td>3</td>
<td>it is not in accordance with</td>
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<td>25,213pg/l</td>
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<td></td>
<td></td>
<td>4</td>
<td>it is not in accordance with</td>
<td>0.558</td>
<td>13.2</td>
<td>in accordance</td>
</tr>
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</table>

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<table>
<thead>
<tr>
<th>No</th>
<th>Sample Point</th>
<th>pH (Recommended Level=6.5-8.5)</th>
<th>Iron (Maximum Level=1mg/l)</th>
<th>Manganese (Maximum Level=0.5mg/l)</th>
<th>Lead (Maximum Level=0.05mg/l)</th>
</tr>
</thead>
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<tr>
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<td>0.371 in accordance with</td>
<td>19.53 it is not in accordance with</td>
<td></td>
</tr>
</tbody>
</table>

**Average** 6.28:
- **Iron**: 0.57 in accordance with 20.52 it is not in accordance with 23.97 in accordance
- **Manganese**: 0.57 in accordance with 20.52 it is not in accordance with 23.97 in accordance
- **Lead**: 0.57 in accordance with 20.52 it is not in accordance with 23.97 in accordance

**Tool River Village**

<table>
<thead>
<tr>
<th>No</th>
<th>Sample Point</th>
<th>pH (Recommended Level=6.5-8.5)</th>
<th>Iron (Maximum Level=1mg/l)</th>
<th>Manganese (Maximum Level=0.5mg/l)</th>
<th>Lead (Maximum Level=0.05mg/l)</th>
</tr>
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<td>24.4 it is not in accordance with</td>
<td>40.957pg/l in accordance</td>
</tr>
<tr>
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<td>5.9</td>
<td>0.799 in accordance with</td>
<td>22.8 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>5.4</td>
<td>1.395 it is not in accordance with</td>
<td>10.6 it is not in accordance with</td>
<td>48.085pg/l in accordance</td>
</tr>
<tr>
<td>15</td>
<td>4</td>
<td>6.7</td>
<td>0.943 in accordance with</td>
<td>12.8 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>6.4</td>
<td>0.684 in accordance with</td>
<td>24.4 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>6</td>
<td>6.3</td>
<td>0.491 in accordance with</td>
<td>19.6 it is not in accordance with</td>
<td>49.681pg/l in accordance</td>
</tr>
<tr>
<td>18</td>
<td>8.35</td>
<td></td>
<td>0.116 in accordance with</td>
<td>14.49 it is not in accordance with</td>
<td></td>
</tr>
</tbody>
</table>

**Average** 6.32:
- **Iron**: 0.71 in accordance with 18.44 it is not in accordance with 46.24 in accordance
- **Manganese**: 0.71 in accordance with 18.44 it is not in accordance with 46.24 in accordance
- **Lead**: 0.71 in accordance with 18.44 it is not in accordance with 46.24 in accordance

**Kaliukan Village**

<table>
<thead>
<tr>
<th>No</th>
<th>Sample Point</th>
<th>pH (Recommended Level=6.5-8.5)</th>
<th>Iron (Maximum Level=1mg/l)</th>
<th>Manganese (Maximum Level=0.5mg/l)</th>
<th>Lead (Maximum Level=0.05mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
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<td>0.698 In accordance with</td>
<td>25 it is not in accordance with</td>
<td>32.021pg/l in accordance</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>6.9</td>
<td>0.905 In accordance with</td>
<td>24.4 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>3</td>
<td>6.2</td>
<td>0.943 In accordance with</td>
<td>24.2 it is not in accordance with</td>
<td>38.511pg/l in accordance</td>
</tr>
<tr>
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<td>0.785 In accordance with</td>
<td>24.6 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>5</td>
<td>6.4</td>
<td>0.496 In accordance with</td>
<td>20.6 it is not in accordance with</td>
<td>44.255pg/l in accordance</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
<td>8.27</td>
<td>0.087 In accordance with</td>
<td>12.6 it is not in accordance with</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Sample Point</td>
<td>pH Level (Recommended Level: 6.5-8.5)</td>
<td>Iron (Maximum Level: 1mg/l)</td>
<td>Manganese (Maximum Level: 0.5mg/l)</td>
<td>Lead (Maximum Level: 0.05mg/l)</td>
</tr>
<tr>
<td>----</td>
<td>--------------</td>
<td>--------------------------------------</td>
<td>---------------------------</td>
<td>-----------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Average</td>
<td>6.76</td>
<td>in accordance</td>
<td>0.65</td>
<td>in accordance</td>
<td>21.90</td>
</tr>
</tbody>
</table>

Ulu Kelampapan Village

| 25 | 1 | 6.9 | in accordance | 0.4 | In accordance | 12.8 | it is not in accordance with 61.277pg/l | in accordance |
| 26 | Point 2 | 6.2 | it is not in accordance with | 0.809 | In accordance | 25 | it is not in accordance with |
| 27 | 3 | 6.3 | it is not in accordance with | 1.063 | it is not in accordance with | 19.6 | it is not in accordance with |
| 28 | 4 | 6.4 | it is not in accordance with | 0.669 | In accordance | 25 | it is not in accordance with 53,936pg/l | in accordance |
| 29 | 5 | 6.7 | in accordance | 0.472 | In accordance | 17.4 | it is not in accordance with 60,532pg/l | in accordance |
| 30 | 6 | 6.6 | in accordance | 0.371 | in accordance | 27.09 | it is not in accordance with |
| Average | 6.52 | in accordance | 0.63 | in accordance | 21.15 | it is not in accordance with 58.58 | in accordance |

Overall Chemistry Average

| 6.44 | it is not in accordance with | 0.68 | in accordance | 21.02 | it is not in accordance with 40.25 | in accordance |

Source: Primary Data 2022

a) pH level

The value of the degree of acidity or pH of the test results from 30 points spread across Astambul District is an average of 6.44 mg/l so that most of the water sources in Astambul District are acidic. This figure is below the standard of water used for sanitation hygiene purposes.

The pH value is an important factor in waters because the pH value in the water will determine the nature of the water to be acidic or alkaline which will affect the biological life in the water (11). According to the Minister of Health Regulation Number 32 of 2017 which states that the standard pH or acidity degree for water used as sanitation hygiene is in the range of 6.5-8.5.

b) Iron

The content of iron (Fe) in the water as a result of testing at 30 points in Astambul District obtained an average of 0.68mg/l. The content of this amount is still below the maximum threshold for water used as a means of sanitation and hygiene. However, there are 4 points (13.33%) where the iron content is higher than the standard.

High levels of Fe metal have an impact on the color of groundwater, where for groundwater samples with the highest Fe metal content it has a brownish color, while water samples with the lowest Fe metal content have a yellowish color. In general, rainwater that falls to the ground and undergoes infiltration into the soil containing FeO will react with H2O and CO2 in the soil and form Fe(HCO3)2 where the deeper the water that seeps into the soil, the higher the solubility of iron carbonate in that water. Groundwater that contains a lot of Fe will turn yellow and cause a metallic taste of Fe in the water and corrode metal objects. The presence of Fe in the water can cause the water to turn yellowish red and cause an unpleasant odor (14).

c) Manganese

The results of testing water samples to see the manganese or Mn content in the water obtained an average of 21.02 mg/l. Very far beyond the maximum threshold set for water used as sanitation hygiene by the community. There is no point that has Mn content according to the standard.

Water containing excess Manganese (Mn) causes taste, color (brown/purple/black), and turbidity. Manganese toxicity is relatively visible at low concentrations. The Mn content allowed in the waters for sanitation hygiene is a maximum of 0.05 mg/l based on the Minister of Health of the Republic of Indonesia No. 32 of 2017. Water originating from acid mining sources may contain dissolved Mn.
with a concentration of ±1 mg/l. At a rather high pH and aerobic conditions, insoluble Mn is formed such as MnO2, Mn3O4 or MnCO3, although the oxidation of Mn2+ is relatively slow.

d) Lead

The level of lead (Pb) in the waters from the test results obtained an average of 40.25 pg/l. This amount is very low compared to the maximum limit set for sanitation hygiene needs. There is no point where the Pb content exceeds the maximum threshold. Heavy metals in waters that are difficult to degrade will be absorbed in the body of organisms so that heavy metals such as Fe, Mn and Pb are classified as dangerous heavy metals and can enter the body through the respiratory and digestive tracts. Heavy metals can cause acute and chronic poisoning. Acute lead poisoning is characterized by a burning sensation in the mouth, the occurrence of irritation in the gastrointestinal tract accompanied by diarrhea and symptoms of chronic poisoning are characterized by nausea, anemia, pain around the stomach and can cause paralysis (9).

2) Water biology testing

Sampling of water to be tested for total coliform at 30 points spread over 5 villages in the Astambul District, the results can be seen in table 5 below.

Table 5 The results of the inspection of the biological quality of clean water in Astambul District in 5 villages (Kelampian Tengah, Kelampapan Ulu, Lok Gabang, Sungai Alat and Kaliukan)

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Total Coliform (Maximum Level=50CFU/100ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Middle Kelampian Village</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>2</td>
<td>Point 2</td>
<td>1600</td>
</tr>
<tr>
<td>3</td>
<td>3 point</td>
<td>1600</td>
</tr>
<tr>
<td>4</td>
<td>4 point</td>
<td>1600</td>
</tr>
<tr>
<td>5</td>
<td>5 point</td>
<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>1280.32</td>
</tr>
<tr>
<td></td>
<td>Lok Gabang Village</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>7</td>
<td>Point 2</td>
<td>1600</td>
</tr>
<tr>
<td>8</td>
<td>3 point</td>
<td>1600</td>
</tr>
<tr>
<td>9</td>
<td>4 point</td>
<td>1600</td>
</tr>
<tr>
<td>10</td>
<td>5 point</td>
<td>1600</td>
</tr>
<tr>
<td>11</td>
<td>6 point</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td>Tool River Village</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>13</td>
<td>Point 2</td>
<td>1600</td>
</tr>
<tr>
<td>14</td>
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</tr>
<tr>
<td>15</td>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Total Coliform (Maximum Level=50CFU/100ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
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</tr>
<tr>
<td>18</td>
<td>7 point</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1600</strong></td>
</tr>
<tr>
<td></td>
<td>Kaliukan Village</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>20</td>
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<td>21</td>
<td>3 point</td>
<td>1600</td>
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<td>1600</td>
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<tr>
<td>23</td>
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<td>1600</td>
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<tr>
<td>24</td>
<td>6 point</td>
<td>1600</td>
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<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1600</strong></td>
</tr>
<tr>
<td></td>
<td>Ulu Kelampapan Village</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>26</td>
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<td>28</td>
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<td>29</td>
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</tr>
<tr>
<td>30</td>
<td>6 point</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1391.67</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Overall Biology Average</strong></td>
<td><strong>1494.4</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data 2022

The results of testing water samples for the number of coliforms per 100ml from all points obtained an average of 1494.4CFU/100ml, this exceeds the maximum limit required for water used for sanitation hygiene purposes, which is 50CFU/100ml. There is only 1 point (3.33%) which has a total coliform value below 50CFU/100ml.

One of the parameters that must be met and has a direct effect on health is microbiological parameters, where one of the indicators is total coliform. In drinking water, the total coliform allowed is very small (50CFU/100ml). If the total coliform content in drinking water exceeds the maximum threshold, then the water is unsafe/unfit for consumption. Unsafe drinking water can certainly have a negative impact on health, especially for vulnerable groups such as toddlers, people with low immunity, and the elderly. One of the health problems that can arise from consuming unsafe water is waterborne disease, where diarrhea is one of the diseases most often associated with improper water consumption (15).

Total coliform is a group of bacteria that includes aerobic and facultative anaerobic bacteria, which are gram-negative bacteria. Most of the total coliform bacteria are heterotrophic and can increase in number in water and soil. Total coliforms can also survive and multiply in water distribution systems, especially if conditions permit. The presence of total coliforms can come from human or animal feces and can also occur naturally in water. Total coliform is only an indicator used to indicate that there could be other microbes in the water, for.
example pathogenic microbes such as Giardia, Cryptosporidium, E.coli, and others (Arsyina, 2019). Based on the regulations contained in the Regulation of the Minister of Health of the Republic of Indonesia No. Total coliform in Astambul District is known to have a very high value. This is because the rivers there are still used as a place for local residents to defecate. This activity is very large which causes a large number of bacteria in a waters. The river is still used by residents for various kinds of daily activities, from bathing to consumption.

IV. CONCLUSION

The availability of clean water in Astambul District based on physical parameters is still feasible and according to standards, where the average measurement results for temperature, DO, TDS and turbidity are according to standards. Based on chemical parameters, water quality in Astambul District is not suitable for consumption and needs to be treated. The results obtained are that the pH and Manganese content are not in accordance with the regulations set by the government. Biological parameter testing obtained a high average total coliform value and the water is not fit for consumption. Astambul sub-district is mostly covered by agricultural land. In addition, there are many swampy areas so that many water hyacinth plants are found and the land area is overgrown with coconut trees. These three plants can be used to help provide clean water by making activated charcoal and absorbing harmful substances in the water. Sources of water in the form of wells without a dividing wall are one of the causes of the problem of the low quality of the water obtained.

REFERENCES


AUTHORS

First Author – Husaini, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Second Author – Anugrah Nur Rahmat, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, Lambung Mangkurat University
Third Author – M. Saidi Hidayat, Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Fourth Author – Taufik, Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Fifth Author – M. Gilmani, Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

Correspondence Author – Husaini, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

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Determination of Critical Points for Water and Soil through Geoelectrical Methods and Potential Natural Resources in Clean Water Management in Flood Prone Areas

Lenie Marlinae*, Agung Waskito*, Rabi’ah Ariana** Ni'ma Farida Fasya**

*Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
**Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

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Abstract-Water is a basic human need covering 50-70%. According to WHO, each person needs between 60-120 liters of water/day, Indonesian people use a lot of water with poor quality or not meeting health standards. Astambul sub-district in five villages as many as 8568 people with poor, vulnerable and disabled people of 2796 people is one of the areas in Banjar Regency that has a clean water crisis, both rainy and dry seasons and coupled with floods every year even every time it rains which causes water quality becomes cloudy and does not meet the physical, chemical and bacteriological quality. This is confirmed based on the results of research by Syamsul A et al, 2021; Laily K et al, 2021; Waskito, 2021 in September 2021 in 6 areas with an average depth of > 75 meters and a resistivity of 89.58 m and the quality of ground water looks cloudy and the condition of well water also does not meet the requirements, namely still cloudy, although with a depth of 5-10 meters main. (2).

Data on the results of river water quality inspections in 2020 in Banjar district that of 8 parameters exceeding the allowable threshold value, namely MPN coli 35000/100 ml of water from the standard of 100 ml/water, TSS of 846 mg/L from 50 mg/L, BOD 398 mg/L from 25 mg/L, COD 189.3 mg/L from 25 mg/L, DO 6 mg/L from 4 mg/L, pH 6-7 from 6-9. The data for 2021 are as follows: turbidity number 57.55, TDS 343.3, Ph 6.69, dissolved oxygen 15.13. This is in line with the results of the research by Waskito et al. In 2021, there are still many people in the Astambul sub-district who have not fulfilled clean water sources that meet health requirements as many as 10,453 people (86%) both from dug wells, drilled wells, river water with details of the Ulu Expansion of 847 people. (52.4%), Middle Kelampian 532 people (36.8%), Limamar 535 people (28.4%), Lok Gabang 780 people (52%), Kaliukan 1744 people (93.1%), Sei Alat 1305 people (63.1%) with an average population of 1742 people per village with the fulfillment of clean water by buying or using water that is not yet suitable as clean water for its physical, chemical and bacteriological quality, namely turbidity well water in Kaliukan Village 336 NTU (standard 25 NTU), Fe 0.371 mg/l in the village of Kelampapan ulu and Tengah (standard 1.0 mg/l), Fe 0.087 mg/l Kaliukan, Fe 0.371 mg/l in Lok Gabang village, Fe 0.371 mg/l in Sungai Sungai Tool, Mn 27.09 mg/l (0.5 mg/l).

Index Terms- Critical points for water and soil, Geoelectricity, GIS, Community Empowerment using natural resources (plants and waste from community activities)

I. INTRODUCTION

Water is the main need in life so that the earth's surface consists of about 75% water. Most of the human body weight is water covering 50-70%. According to WHO, each person needs between 60-120 liters of water/day, while in developing countries, including Indonesia, each person needs between 30-60 liters of water/day (1).
in the village of Kelampapan ulu, Desa Kelampapan Tengah, Mn 28.98 mg/L, Mn 12.60 mg/L Kaliukan, Mn 19.53 mg/L, Lok Gabang, Mn 14.49 mg/l Sungai Alat, pH 6 (standard 6.5 - 9.5), MPN Coli > 1600 /100 ml. Groundwater (Lok Gabang) Mn 0.036, (Lok Gabang) Fe 1.77, (Lok Gabang) turbidity 18.67, (Lok Gabang) pH 7.6, MPN Coli > 1600 /100 ml. Kaliukan Kekruhan Village River Water 22.43 NTU, pH 7.2, If the water is used by the community for their daily needs. Health impacts that may arise in the long term due to poor quality water are bone loss, tooth corrosion, anemia, and kidney damage. This happens because the water is contaminated with heavy metals which are usually toxic and precipitate in the kidneys (1). Water quality will decrease in addition to pollution as well as natural conditions/disasters such as floods. Data from disaster risk studies in 2016-2020 in Banjar Regency, a sub-district that has a high class hazard, one of which is Astambul District. Astambul sub-district was hit by floods in 2021 with a total of 9 villages with 35313 people with a population density per km2 of 163 people with a flood height of 1-2.5 m, and community empowerment activities in the health sector in clean water treatment obtained from combining threats, vulnerabilities and capacities in each risk component, which can then be used as a reference for decision making in planning and management of flood and water-prone disasters and community empowerment (3, 4, 5). The method in community empowerment activities is filtration and adsorption techniques can use natural materials that grow such as water hyacinth and moringa and waste left over from community activities around the community such as rice straw, husks, coconut fibers, coconut shells, market charcoal. Each of them has advantages in improving water quality, such as Moringa leaves (Moringa oleifera) can be used to purify water because they contain nine amino acids, sucrose, D-glucose, alkaloids, wax, quercetin and kaempferate are also rich in potassium and calcium. Moringa leaves contain vitamins, carotenoids, polyphenols, phenolic acids, flavonoids, alkaloids, glucosinolates, isothiocyanates, tannins, saponins, and oxalates.

II. RESEARCH METHODS
This study uses a quantitative research design with a cross-sectional method, namely to look at factors related to mapping clean water sources in flood and mining areas based on seasonal trends and community empowerment using geoelectrical and GIS methods. In this study, the research sample will be water and soil in Astambul District which are homogenized with the Purposive Sampling technique.

1. Independent variable (independent variable)
The independent variables in this study are water sources (depth, discharge and potential)
2. Dependent variable (dependent variable)
The dependent variable in this study is the availability of clean water which is included in the map of clean water sources using the GIS method

III. WRITE DOWN YOUR STUDIES AND FINDINGS

<table>
<thead>
<tr>
<th>Ulu Expansion, Lok Gabang, Alat River and Kaliukan</th>
<th>Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Sample</td>
</tr>
<tr>
<td>-----</td>
<td>--------</td>
</tr>
<tr>
<td>Middle Kelampian Village</td>
<td>1 point</td>
</tr>
<tr>
<td>2</td>
<td>Point 2</td>
</tr>
<tr>
<td>3</td>
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</tr>
<tr>
<td>4</td>
<td>4 point</td>
</tr>
<tr>
<td>5</td>
<td>5 point</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
</tr>
<tr>
<td>Lok Gabang Village</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Point 2</td>
</tr>
<tr>
<td>8</td>
<td>3 point</td>
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<td>9</td>
<td>4 point</td>
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<tr>
<td>10</td>
<td>5 point</td>
</tr>
<tr>
<td>11</td>
<td>6 point</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
</tr>
</tbody>
</table>
Soil sample testing in 5 villages of Astambul District was seen based on 6 indicators, namely organic carbon, organic matter, water content, soluble Mn, soluble Fe and permeability. The average value of soil organic carbon from all sampling points is 1.09%. The highest value is at point 3 in Kelampapan Ulu Village at 2.14% and the lowest at point 2 in Lok Gabang Village at 0.41%. The average value of organic matter for all points of collection was 1.9%. The village with the highest average score is Kelampapan Ulu Village at 2.75% and the highest point is at point 3 Kelampapan Ulu Village at 3.73%. The water content in the soil for all points has an average of 21.03%. Kaliukan Village has the highest average water content of 26.85% and the point with the highest water content is also found in Kaliukan Village at point 1 of 34.56%. The average soluble Mn content for all points was 4.73ppm. Villages with the highest average soluble Mn content were found in Sungai Alat Village at 11.10 ppm and the point with soluble Mn levels was at point 5 in Sungai Alat Village at 49.14 ppm. The average soluble Fe content was found in Sungai Alat Village at 218.22 ppm and the point with the highest soluble Fe content was also found in Sungai Alat Village point 5 at 1217.94 ppm. The average soluble Fe content for all points was 52.69ppm. The village with the highest soluble Fe content was found in Sungai Alat Village at 49.14 ppm and the point with soluble Fe levels was at point 5 in Sungai Alat Village at 11.10 ppm and the point with soluble Mn levels was at point 5 in Sungai Alat Village.
at 49.14 ppm. The average soluble Fe content for all points was 52.69ppm. The village with the highest soluble Fe content was found in Sungai Alat Village at 218.22 ppm and the point with the highest soluble Fe content was also found in Sungai Alat Village point 5 at 1217.94 ppm. The average soil permeability from all points is 2.47cm/hour. The village with the highest average level of soil permeability is in Sungai Alat Village of 2.94cm/hour and the highest point of soil permeability is at point 1 in Sungai Alat Village of 4.54 cm/hour. 14ppm. The average soluble Fe content for all points was 52.69ppm. The village with the highest soluble Fe content was found in Sungai Alat Village at 218.22 ppm and the point with the highest soluble Fe content was also found in Sungai Alat village point 5 at 1217.94 ppm. The average soil permeability from all points is 2.47cm/hour. The village with the highest average level of soil permeability is in Sungai Alat Village of 2.94cm/hour and the highest point of soil permeability is at point 1 in Sungai Alat Village of 4.54 cm/hour. 14ppm. The average soluble Fe content for all points was 52.69ppm. The village with the highest soluble Fe content was found in Sungai Alat Village at 218.22 ppm and the point with the highest soluble Fe content was also found in Sungai Alat Village point 5 at 1217.94 ppm. The average soil permeability from all points is 2.47cm/hour. The village with the highest average level of soil permeability is in Sungai Alat Village of 2.94cm/hour and the highest point of soil permeability is at point 1 in Sungai Alat Village of 4.54 cm/hour. The average soluble Fe content from all points is 52.47cm/hour. The village with the highest average level of soil permeability is in Sungai Alat Village of 2.94cm/hour and the highest point of soil permeability is at point 1 in Sungai Alat Village of 4.54 cm/hour.

Soil organic carbon (C) is a fundamental component in the global carbon cycle to support the sustainability of terrestrial ecosystems (Agus 2013; Siringoringo 2014). Soil C-organic is formed through several stages of organic matter decomposition. Soil C-organic status is influenced by various external factors such as soil type, rainfall, temperature, input of organic matter from above-ground biomass, anthropogenic processes, soil management activities, and CO2 content in the atmosphere (Hairiah et al. 2001; Hairiah et al. 2011; Yulnafatimawita et al. 2011 in Farrasati, 2019). Changes in the C-organic status of the soil through the process of decomposition and mineralization of soil organic matter are reported to have a relationship with soil properties such as texture, pH, metal cations in the soil, CEC (cation exchange capacity), and nitrogen content (6).

Organic matter can be defined as all materials derived from plant and animal tissues, both living and dead. Soil organic matter is a complex and dynamic material, derived from the remains of plants and animals in the soil and undergoing continuous degradation. Soil organic matter is formed from living soil organisms consisting of flora and fauna, living and dead plant roots, which are decomposed and modified as well as new synthesis products derived from plants and animals. Soil organic matter plays an important role in determining the physical, chemical, and biological activities in the soil that determine the carrying capacity and productivity of the land. Organic matter is generally found on the soil surface in the amount of only about 3-5% (7).

Organic matter is a complex and dynamic system, sourced from plant or animal residues found in the soil that continuously changes shape, because it is influenced by physical, biological, and chemical factors. Reintjes et al., (1992 in Nangaro) suggested that the function of soil organic matter, among others, is to store nutrients which are slowly released into the groundwater solution and made available to plants. Organic matter in or above the soil also protects and helps regulate soil temperature and humidity. Organic matter can also increase soil support (7).

The results showed that degraded paddy fields were one of the indications due to low organic matter and potassium. Organic matter has an important role in determining the ability of the soil to support plants, so that if the level of soil organic matter decreases, the ability of the soil to support plant productivity also decreases (8).

The C-Organic content of the soil can be low because the absence of the use of organic fertilizers in a field is the main factor in the low C-organic content of the soil. The land only uses inorganic fertilizers to increase soil fertility (9).

Soil water content is the ability of the soil to bind water which is influenced by matrix, osmotic and capillary binding forces. These forces are caused by the attraction between soil particles to one another and is also influenced by the electrostatic charge density of the soil particles. The disturbance and changes in volume weight, soil pore volume and pore size distribution cause variations in water content in the soil. The value of water content can be obtained by gravimetric method, namely the weight of the initial wet soil with the weight of the oven dry soil (10).

<table>
<thead>
<tr>
<th>Table 3. Results of inspection of the physical quality of clean water in Astambul District in 5 villages (Kelampian Tengah, Kelampanan Ulu, Lok Gabang, Sungai Alat and Kaliukan)</th>
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<tr>
<td><strong>Physique</strong></td>
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<th>DO (Minimum Level 6)</th>
<th>TDS (Maximum Level=1000)</th>
<th>Turbidity (Maximum Level=25)</th>
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<td>it is not in accordance with</td>
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</tr>
</tbody>
</table>

**Lok Gabang Village**

|    |          |              | in accordance                                 | it is not in accordance with | in accordance            | 48.25                        |
| 6  | 1 point 31.5 |              | 1.8                                           | 287                      | in accordance            |                             |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 7  | Point 2 27  |              | 5.6                                           | 178                      | in accordance            | 17.46                        |
| 8  | 3 point 27  |              | in accordance                                 | 20                     | 127                      | 11.62                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 9  | 4 point 28  |              | in accordance                                 | 14.4                   | 95                       | 11.4                         |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 10 | 5 point 28  |              | in accordance                                 | 3.8                    | 148                      | 34.55                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 11 | 6 point 27  |              | in accordance                                 | 4.8                    | 185                      | 27.3                         |
| Average |           |              | in accordance                                 | 8.40                  | 170                      | 25.10                        |
|    |              |              |                                               | it is not in accordance with |                           |                             |

**Tool River Village**

|    |          |              | in accordance                                 | it is not in accordance with | in accordance            | 6                            |
| 12 | 1 point 30.3 |              | 1.4                                           | 162                      | in accordance            |                             |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 13 | Point 2 28  |              | 5.5                                           | 159                      | in accordance            | 30.77                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 14 | 3 point 27  |              | in accordance                                 | 6.1                    | 158                      | 49.56                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 15 | 4 point 27  |              | in accordance                                 | 6.2                    | 231                      | 20.78                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 16 | 5 point 27  |              | in accordance                                 | 6.7                    | 105                      | 6.43                         |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 17 | 6 point 27  |              | in accordance                                 | 32.1                   | 258                      | 33.09                        |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
| 18 | 7 point 29  |              | in accordance                                 | 2.6                    | 86                       | 5.16                         |
|    |              |              |                                               | it is not in accordance with | in accordance            |                             |
Table 1: Physique

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Temperature (Maximum Level=Air Temperature ±3)</th>
<th>DO (Minimum Level 6)</th>
<th>TDS (Maximum Level=1000)</th>
<th>Turbidity (Maximum Level=25)</th>
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<td>Average</td>
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<td>in accordance</td>
<td>in accordance</td>
<td>in accordance</td>
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</table>

Kaliukan Village

- 19 1 point: 35.9 it is not in accordance with 5.3 it is not in accordance with 339 in accordance 6.08 in accordance
- 20 Point 2: 28 in accordance 31 in accordance 119 in accordance 30.19 in accordance
- 21 3 point: 27 in accordance 8.4 in accordance 177 in accordance 23.35 in accordance
- 22 4 point: 28 in accordance 4.3 it is not in accordance with 87 in accordance 4.31 in accordance
- 23 5 point: 27 in accordance 8.1 it is not in accordance with 71 in accordance 17.01 in accordance
- 24 6 point: 27 in accordance 19.2 it is not in accordance with 93 in accordance 21.82 in accordance
- Average: 28.82 in accordance 12.72 in accordance 147.67 in accordance 17.13 in accordance

Ulu Kelampapan Village

- 25 1 point: 34.3 it is not in accordance with 3.1 it is not in accordance with 261 in accordance 10.42 in accordance
- 26 Point 2: 29 in accordance 3.3 it is not in accordance with 296 in accordance 2.22 in accordance
- 27 3 point: 27 in accordance 5.4 it is not in accordance with 276 in accordance 12.66 in accordance
- 28 4 point: 27 in accordance 4.4 it is not in accordance with 223 in accordance 41.95 in accordance
- 29 5 point: 26 in accordance 8.8 it is not in accordance with 223 in accordance 14.21 in accordance
- 30 6 point: 27 in accordance 6.9 it is not in accordance with 164 in accordance 5.38 in accordance
- Average: 28.38 it is not in accordance with 5.32 it is not in accordance with 240.50 it is not in accordance with 14.47 it is not in accordance with

Overall Physical Average: 28.46 in accordance 8.03 in accordance 179.27 in accordance 17.23 in accordance

Source: Primary Data 2022

a) Temperature

The results of testing water samples at 30 points spread across Astambul District found that the water temperature was suitable for sanitation hygiene purposes according to the Minister of Health Regulation Number 32 of 2017. However, there were 4 points (13.33%) which had water temperatures below the standard of the regulations in the village. Kelampapan Tengah, Kaliukan Village and Kelampapan Ulu Village.
The temperature of the water is very dependent on the place where the water is located. The increase in water temperature in water bodies, waterways, rivers, lakes and so on will have consequences in the form of 1) The amount of dissolved oxygen in the water decreases; 2) The speed of chemical reactions increases; 3) The life of fish and other aquatic animals is disturbed (11). Water temperature that exceeds normal limits indicates that there are dissolved chemicals in large enough quantities (eg phenol or sulfur) or that the process of decomposition of organic matter by microorganisms is taking place. If the condition of the water is like this, then the water is said to be unfit for drinking and can interfere with health (12).

b) DO (Dissolved Oxygen)
Dissolved Oxygen (DO) testing on water samples in Astambul District obtained an average of 8.03 mg/l and is in accordance with the water used for sanitation hygiene needs. At some points, the number of DO is still below the standard, namely 16 points (53.3%) and spread over 6 villages (Kelampian Tengah, Kelampapan Ulu, Lok Gabang, Sungai Alat, and Kaliukan).

Dissolved Oxygen (DO) is the amount of oxygen dissolved in a certain volume of water at a certain temperature and pressure. DO in water is needed to support the life of the organisms in it (Saksena et al., 2008). The main source of DO is photosynthesis, besides river characteristics also affect the presence of DO. The characteristic of the river which is relatively flat shows a flow pattern that is relatively calm and there is no turbulence which will reduce the process of re-aeration of air into the water so that the process of diffusion of oxygen into the river water is not optimal (13).

c) TDS (Total Dissolved Solid)
The average value of Total Dissolved Solid (TDS) obtained is 179.27 mg/l and is in accordance with the water requirements used for sanitation hygiene needs according to the Minister of Health Regulation No. 32 of 2017. There were no sampling points that had the amount of TDS exceeding the maximum threshold.

Total Dissolved Solids (TDS) are dissolved materials (10-6mm diameter) and colloids (10-6mm-10-3mm diameter) in the form of chemical compounds and other materials that are not filtered on filter paper. diameter 0.45 m (14).

d) Turbidity
The results of the turbidity level test obtained an average of 17.23NTU. This figure is below the maximum threshold for water used as sanitation hygiene so that in terms of turbidity it still meets the standard. However, there are 8 points (26.67%) which have a high level of turbidity or above 25NTU so that it does not meet the feasibility of water used for sanitation hygiene according to Minister of Health Regulation No. 32 of 2017.

The turbidity value indicates that the river water is not suitable for consumption. The turbidity of river water is caused by the amount of material suspended in the river water, such as soil, mud and other organic materials. Suspended sediment from land is carried by surface runoff when it rains (15).

1) Chemical testing
Sampling of water for chemical testing at 30 points spread over 5 villages in the Astambul District, the results can be seen in the following table.

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Chemical</th>
<th>pH (Recommended Level=6.5-8.5)</th>
<th>Iron (Maximum Level=1mg/l)</th>
<th>Manganese (Maximum Level=0.5mg/l)</th>
<th>Lead (Maximum Level=0.05mg/l)</th>
</tr>
</thead>
<tbody>
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<th>No</th>
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<td>1 point</td>
<td>6.9 in accordance</td>
<td>0.4</td>
<td>12.8</td>
<td>it is not in accordance with 61,277pg/l</td>
</tr>
<tr>
<td>26</td>
<td>2 Point</td>
<td>6.2 it is not in accordance with</td>
<td>0.809</td>
<td>25</td>
<td>it is not in accordance with 61,277pg/l</td>
</tr>
<tr>
<td>27</td>
<td>3 point</td>
<td>6.3 it is not in accordance with</td>
<td>1.063</td>
<td>19.6</td>
<td>it is not in accordance with 61,277pg/l</td>
</tr>
<tr>
<td>28</td>
<td>4 point</td>
<td>6.4 it is not in accordance with</td>
<td>0.669</td>
<td>25</td>
<td>it is not in accordance with 61,277pg/l</td>
</tr>
<tr>
<td>29</td>
<td>5 point</td>
<td>6.7 in accordance</td>
<td>0.472</td>
<td>17.4</td>
<td>it is not in accordance with 60.532pg/l</td>
</tr>
<tr>
<td>30</td>
<td>6 point</td>
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<td>27.09</td>
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</tr>
<tr>
<td></td>
<td>Average</td>
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<td>0.63 in accordance</td>
<td>21.15 in accordance</td>
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<tr>
<td></td>
<td>Overall Chemistry Average</td>
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<td>21.02 in accordance</td>
<td>40.25 in accordance</td>
<td></td>
</tr>
</tbody>
</table>

Source: Primary Data 2022

a) pH level

The value of the degree of acidity or pH of the test results from 30 points spread across Astambul District is an average of 6.44 mg/l so that most of the water sources in Astambul District are acidic. This figure is below the standard of water used for sanitation hygiene purposes.

The pH value is an important factor in waters because the pH value in the water will determine the nature of the water being acidic or alkaline which will affect the biological life in the water (13). According to the Minister of Health Regulation Number 32 of 2017 which states that the standard pH or acidity degree for water used as sanitation hygiene is in the range of 6.5-8.5.

b) Iron
The content of iron (Fe) in the water as a result of testing at 30 points in Astambul District obtained an average of 0.68mg/l. The content of this amount is still below the maximum threshold for water used as a means of sanitation and hygiene. However, there are 4 points (13.33%) where the iron content is higher than the standard. High levels of Fe metal have an impact on the color of groundwater, where for groundwater samples with the highest Fe metal content it has a brownish color, while water samples with the lowest Fe metal content have a yellowish color. In general, rainwater that falls to the ground and undergoes infiltration into the soil containing FeO will react with H2O and CO2 in the soil and form Fe(HCO3)2 where the deeper the water that seeps into the soil, the higher the solubility of iron carbonate in that water. Groundwater that contains a lot of Fe will turn yellow and cause a metallic taste of Fe in the water and corrode metal objects. The presence of Fe in the water can cause the water to turn yellowish red and cause an unpleasant odor (16).

c) Manganese
The results of testing water samples to see the manganese or Mn content in the water obtained an average of 21.02 mg/l. Very far beyond the maximum threshold set for water used as sanitation hygiene by the community. There is no point that has Mn content according to the standard. Water containing excess Manganese (Mn) causes taste, color (brown/purple/black), and turbidity (Fauzia, 2010 in Febrina, 2015). Manganese toxicity is relatively visible at low concentrations. The Mn content allowed in the waters for sanitation hygiene is a maximum of 0.05 mg/l based on the Minister of Health of the Republic of Indonesia No. 32 of 2017. Water originating from acid mining sources may contain dissolved Mn with a concentration of ±1 mg/l. At a rather high pH and aerobic conditions, insoluble Mn is formed such as MnO2, Mn3O4 or MnCO3, although the oxidation of Mn2+ is relatively slow.

d) Lead
The level of lead (Pb) in the waters from the test results obtained an average of 40.25 pg/l. This amount is very low compared to the maximum limit set for sanitation hygiene needs. There is no point where the Pb content exceeds the maximum threshold. Heavy metals in waters that are difficult to degrade will be absorbed in the body of organisms so that heavy metals such as Fe, Mn and Pb are classified as dangerous heavy metals and can enter the body through the respiratory and digestive tracts (Darmono, 2001 in Koniyo, 2020). Heavy metals can cause acute and chronic poisoning. Acute lead poisoning is characterized by a burning sensation in the mouth, irritation in the gastrointestinal tract accompanied by diarrhea and symptoms of chronic poisoning are characterized by nausea, anemia, pain around the stomach and can cause paralysis (11).

2) Water biology testing
Sampling of water to be tested for total coliform at 30 points spread over 5 villages in the Astambul District, the results can be seen in table 5 below.

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Total Coliform (Maximum Level=50CFU/100ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
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<tr>
<td>1</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>2</td>
<td>Point 2</td>
<td>1600</td>
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<tr>
<td>3</td>
<td>3 point</td>
<td>1600</td>
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<tr>
<td>4</td>
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<tr>
<td>5</td>
<td>5 point</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>1280,32</td>
<td></td>
</tr>
</tbody>
</table>

2) Water biology testing
Sampling of water to be tested for total coliform at 30 points spread over 5 villages in the Astambul District, the results can be seen in table 5 below.

<table>
<thead>
<tr>
<th>No</th>
<th>Sample</th>
<th>Total Coliform (Maximum Level=50CFU/100ml)</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>6</td>
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<tr>
<td>7</td>
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<tr>
<td>8</td>
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</tr>
<tr>
<td>9</td>
<td>4 point</td>
<td>1600</td>
</tr>
<tr>
<td>No</td>
<td>Sample</td>
<td>Total Coliform (Maximum Level=50CFU/100ml)</td>
</tr>
<tr>
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<td>------------------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>5 point</td>
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<tr>
<td>11</td>
<td>6 point</td>
<td>1600</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1600</strong></td>
</tr>
<tr>
<td></td>
<td>Tool River</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1 point</td>
<td>1600</td>
</tr>
<tr>
<td>13</td>
<td>Point 2</td>
<td>1600</td>
</tr>
<tr>
<td>14</td>
<td>3 point</td>
<td>1600</td>
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<tr>
<td>15</td>
<td>4 point</td>
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<td>16</td>
<td>5 point</td>
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<tr>
<td>17</td>
<td>6 point</td>
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<tr>
<td>18</td>
<td>7 point</td>
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<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1600</strong></td>
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<tr>
<td></td>
<td>Kaliukan</td>
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<tr>
<td>19</td>
<td>1 point</td>
<td>1600</td>
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<tr>
<td>20</td>
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<tr>
<td>21</td>
<td>3 point</td>
<td>1600</td>
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<tr>
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<tr>
<td>23</td>
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</tr>
<tr>
<td>24</td>
<td>6 point</td>
<td>1600</td>
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<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1600</strong></td>
</tr>
<tr>
<td></td>
<td>Ulu Kelampapan</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>1 point</td>
<td>1600</td>
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<tr>
<td>26</td>
<td>Point 2</td>
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<tr>
<td>27</td>
<td>3 point</td>
<td>1600</td>
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<tr>
<td>28</td>
<td>4 point</td>
<td>1600</td>
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<tr>
<td>29</td>
<td>5 point</td>
<td>1600</td>
</tr>
<tr>
<td>30</td>
<td>6 point</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td><strong>Average</strong></td>
<td><strong>1391.67</strong></td>
</tr>
</tbody>
</table>
The availability of clean water in Astambul District based on physical parameters is still feasible and according to standards, where the average measurement results for temperature, DO, TDS and turbidity are according to standards. Based on chemical parameters, water quality in Astambul District is not suitable for consumption and needs to be treated. The results obtained are that the pH and Manganese content are not in accordance with the regulations set by the government. Biological parameter testing obtained a high average total coliform value and the water is not fit for consumption. Astambul sub-district is mostly covered by agricultural land. In addition, there are many swampy areas so that many water hyacinth plants are found and the land area is overgrown with coconut trees. These three plants can be used to help provide clean water by making activated charcoal and absorbing harmful substances in the water. Sources of water in the form of wells without a dividing wall are one of the causes of the problem of the low quality of the water obtained.

**IV. CONCLUSION**

The results of testing water samples for the number of coliforms per 100ml from all points obtained an average of 1494.4CFU/100ml, this exceeds the maximum limit required for water used for sanitation hygiene purposes, which is 50CFU/100ml. There is only 1 point (3.33%) which has a total coliform value below 50CFU/100ml.

One of the parameters that must be met and has a direct effect on health is microbiological parameters, where one of the indicators is total coliform. In drinking water, the total coliform allowed is very small (50CFU/100ml). If the total coliform content in drinking water exceeds the maximum threshold, then the water is unsafe/unfit for consumption. Unsafe drinking water can certainly have a negative impact on health, especially for vulnerable groups such as toddlers, people with low immunity, and the elderly. One of the health problems that can arise from consuming unsafe water is waterborne disease, where diarrhea is one of the diseases most often associated with improper water consumption (17).

Total coliform is a group of bacteria that includes aerobic and facultative anaerobic bacteria, which are gram-negative bacteria. Most of the total coliform bacteria are heterotrophic and can increase in number in water and soil. Total coliforms can also survive and multiply in water distribution systems, especially if conditions permit. The presence of total coliforms can come from human or animal feces and can also occur naturally in water. Total coliform is only an indicator used to indicate that there could be other microbes in the water, for example pathogenic microbes such as Giardia, Cryptosporidium, E.coli, and others (Arsyina, 2019). Based on the regulations contained in the Regulation of the Minister of Health of the Republic of Indonesia No. 36/Menh/IV/2009, total coliform in Astambul District is known to have a very high value. This is because the rivers there are still used as a place for local residents to defecate. This activity is very large which causes a large number of bacteria in a waters. The river is still used by residents for various kinds of daily activities, from bathing to consumption.

### REFERENCES


AUTHORS

First Author – Lenie Marlinae, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Second Author – Agung Waskito, Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, Lambung Mangkurat University
Third Author – Rabi’ah Arliana Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Fourth Author – Ni’ma Farida Fasya Student of Public Health Program, Faculty of Medicine, University of Lambung Mangkurat

Correspondence Author – Lenie Marlinae Environmental Health, Department of Environmental Health, Public Health Program, Faculty of Medicine, University of Lambung Mangkurat
Think Tanks in Malaysia and Their Attributes

Mohd Harridon1,2,3, Farhan Abdullah3, Nurhayati Mohd Nur1

1Aviation Physical Fitness Cluster Universiti Kuala Lumpur Malaysian Institute of Aviation Technology,
2Malaysia Civil Defence Force,
3Sky Orbital Centre for Human Advancement (SOCHA)

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Abstract- The role of a Think Tank is to advocate certain policies and areas where the Think Tank would actuate research and analysis upon those particular areas of interest. It is common at the end of the analysis, results that were gained would be published in a form of academic or working papers. In Malaysia there exist numerous Think Tanks and this paper explored their attributes.

I. INTRODUCTION

Think Tanks have a role in creating the appropriate ecosystem to alleviate knowledge and understanding toward contemporary issues that behold society. Think Tanks are bodies or organizations that bridge the gaps between academia and industry. Hence their working papers or policy papers usually touched upon predicaments face by industries as a whole but within the analyses framework of academia. Industrial predicaments are normally associative with socio-economic realm where we can observe an example of oversupply of workers tend to introduce or increase unemployment since available employments are scarce. Within this context, it can be seen in the results that we had compiled, all Think Tanks that we had listed in this paper have actuated works, research, and analyses upon Domestic Economics (refer to Figure 3 of this paper).

According to Hurst, there should be collaborative efforts between academia and society in order to bring society into manners that are progressive and sustainable [1]. Hurst pointed out that in Canada there are gaps that are needed to be filled to achieve this seamless connection between academia and society [1]. We agreed with this notion and our paper had addressed this issue in collective fashion via the accumulation of relevant data and information.

This is in contrast with Snider which claimed that Think Tanks do not bestow credits upon ideas or solutions that were used or stated in their publications [2]. This had led to false assumptions that Think Tanks were the originator of these ideas and this conjecture can be passed on and distributed widely which in hand had robbed the credits from the originator [2].

As stated earlier, much of the concentration of Think Tanks are within the realm of Economics which denotes holistically the livelihood of the population. Several factors contribute to the magnitude of the economy and Harridon stated that optimum productivity of workers is vital in fabricating a vibrant economy [3]. Harridon further noted that there are numerous reasons and parameters that accord productivity it’s degree of intensity [3]. One of them is the proper molding of workers in order to produce desirable traits in them.

For this paper, we had employed the Classification Method to classify the areas that are indulged or partake by the Think Tanks in Malaysia. Nanba and et al considered Classification as an approach that organize entities into structured matters where this is helpful in analysis and search pedagogy [4]. They also stipulated that the process of reviewing subjects is made easier via the utilization of cataloging or classification and they even recommended clustering for the purpose of rearrangement of subjects [4].

Kandimalla and et al asserted that categorization or classification is a process that is akin to knowledge extraction where intended knowledge is extracted from a pool of sources [5]. An efficient knowledge extraction process ensures information or data is readily available to be utilized and used. Kandimalla and et al suggested an integration between neural network dan data in order to gain swift extraction of knowledge from different sources [5].

Numerous academicians and researchers had studied Think Tanks and their attributes. For example, Tarango and et al had discerned Think Tanks in Latin America and they stipulated that most Think Tanks have the tendencies to be inclined towards neoliberalism [6]. Tarango and et al also mentioned that Think Tanks are tools to disseminate knowledge and information for the good of society [6]. Most Think Tanks are egalitarian in nature and are supportive of fair distribution of sources, resources, and knowledge to the masses.

Most Think Tanks regularly actuate investigations into many issues and areas where these investigations led to several working papers that provided solutions to myriads problems. Most investigations followed a defined methodology which are portable across various subjects. For example, Harridon had utilized a structured approach to investigate issues or incidents related to Aviation and the approach is dynamic in nature and it is adaptable...
for several scenarios [7]. The importance of investigation had been consistently pointed out as the core of the predicament is dissected to reveal the underlying crux.

II. LITERATURE REVIEW

There existed a notion that Think Tanks are in existence to promote and influence the society towards certain views. Zhang and Guo asserted that Think Tanks, through their publications of papers and reviews, have the ingrained power to sway opinions of the masses and this is critical if a collective effort is required to achieve a singular vision of a nation [8]. Zhang and Guo had evaluated Think Tanks in China in terms of orientation and inclination and they found out their orientations and inclinations varies and different from each other although there are similarities in some sense [8].

Christensen and Holst concurred with Zhang and Guo. Christensen and Holst had assessed Think Tanks in Norway and they delineated the commitments of each Think Thank in their study [9]. Christensen and Holst made relative comparison among these Think Tanks in terms of their positions in various issues and subjects and also the methodology used in gathering pertinent data [9].

One of the methods of assessment is the usage of Threats and Opportunities to dissect issues. Harridon had utilized the Threats and Opportunities Method to review several scenarios which showed vast differences among them [10]. The Threats and Opportunities Method is generally modifiable in accordance to the subjected scenario where the method, in terms of gist and simplicity, lists down components of Threats and Opportunities pursuant to the scenario [10].

As mentioned earlier, Classification Method is a good approach to evaluate the attributes of Think Tanks. According to Rivest and et al, several classification methods existed and they recommended Deep Learning Classification Technique to categorize entities in order for assessment to take place in an optimum manner [11]. They had tried out this method with success and stipulated that the performance of the Deep Learning Classification Technique is similar to manual classification [11].

Classification Method is universally adaptable to myriad scenarios and it is engageable for various circumstances. Harridon had utilized the Classification Method to gauge the intricacies of uniforms and attires where functionalities, aesthetic beauty, and other prominent entities of the attires were classified and this had aided the evaluation and assessment process [12]. The good disposition or trait of the Classification Method had made this method popular among researchers and academicians where evidently its usage is wide and across the globe.

Loures and et al had also use the Classification Method to categorize the skillsets and expertise of academicians in Brazil and their purpose is to match these skillsets and expertise to the relevant subjects taught at universities [13]. They reckon if the matches are excellent, the taught subjects would be consistently updated and enhanced with materials that are abreast within a contemporary framework [13].

It is imperative to assess Think Tanks since their roles are vital to the alleviation of society. Hauck mentioned the abstractness of Think Tanks and stated that their functionalities are bordering between political movement and academia [14]. Hauck stipulated that Think Tanks tended to influence the political sphere while remaining steadfast to the economical cause and social equality [14]. Venturing into social equality is perhaps a venture that is most favorable among the masses, and throughout an infinite time frame this is a popular social cause.

III. METHODOLOGY

The assessment of Think Tanks in Malaysia was done through a defined structure which is shown in Figure 1.

Figure 1. The Approach to Assess the Attributes of Think Tanks in Malaysia
Several areas that were indulged or researched by Think Tanks were identified. This is an arbitrary process since the list is not exhaustive in nature and there might be a small chance that some areas were left out. But if one looks at Table 1, the areas defined were somehow prominent among Think Tanks. Our classification is thus via areas of indulgence of Think Tanks. We then proceeded in identifying Think Tanks that existed in Malaysia. The Think Tanks in Malaysia were then mapped against the areas of interest. The mapping process is through tabulation and this is shown in Table 1.

Graphical representations of Table 1 were produced where the representations showed the trends among Think Tanks. This is useful to gauge the inclinations of the Think Tanks in Malaysia. Several pointers were then discussed and conclusions were made.

IV. Results

The results of our methodology are shown in Table 1 and Figures 2 and 3.

Table 1. Tabulation of Think Tanks and their Areas of Interest

<table>
<thead>
<tr>
<th>Think Tank</th>
<th>Areas of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASLI</td>
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<tr>
<td>CPPS</td>
<td>√</td>
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<tr>
<td>IDR</td>
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<tr>
<td>IR</td>
<td>√</td>
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<tr>
<td>IDEAS</td>
<td>√</td>
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<td>IDS</td>
<td>√</td>
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<td>IKIM</td>
<td>√</td>
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<tr>
<td>IAIS</td>
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<td>KSI</td>
<td>√</td>
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<tr>
<td>TWN</td>
<td>√</td>
</tr>
</tbody>
</table>

Denotations:

V. DISCUSSION

With regards to Table 1, it is noted that not all Think Tanks in Malaysia are involved in all the areas that were presented. A proper observation can be done by utilizing Figure 2. It is interesting to note that SEACEN Research and Training Centre is inclined to actuate research and works upon 2 areas only where those 2 areas are International and Domestic Economics. This is understandable as the organization is under the tutelage of the Central Bank of Malaysia.

Another notable observation is Institut Rakyat which emphasized upon Social Policy and Domestic Economics only. The propensity towards those 2 areas is perhaps due to its linkages with a political party in Malaysia which concentrates primarily upon social causes and the well being of the masses or population. Concentration upon niche areas would somehow be beneficial as a majority of the effort and advocation is focuses upon a small set and thus more could be accomplished with regards to the intended areas.

This however does not indicate lesser efforts by other Think Tanks that focused upon various and numerous areas. A
good example would be the Institute for Democracy and Economic Affairs (IDEAS) which indulged upon 10 areas of interest. Although the institute’s indulgence is wide, it had produced formidable analyses, reports, and papers within the areas it had partake. The ASEAN Integration Report 2021, published by IDEAS, is a comprehensive report that touched upon several issues in South East Asia. The report is thorough and it gave an in-depth overview of the contemporary scenarios in South East Asia. This shows that the performances of Think Tanks are not solely based upon the number of areas that they had partake.

Pertaining to Figure 3, it can be seen that Domestic Economics is the most popular area to be researched and partake upon with 20 Think Tanks involved in this area. The livelihood and daily activities of the population are impacted by the national economy and hence this field is heavily analyzed by all Think Tanks in our list. We can duly state that the well being of the masses are critical and is the subject of concern by all Think Tanks.

Security and International Development are areas which only a minority of Think Tanks were involved. Its plausible that such areas require amassment of data in enormous fashion from international and domestic sources and thus making them challenging in terms of analyses and postulations. We do however reserve our comments as such areas are complex and intricate in nature and several factors come into play with regards to analyses and elucidations. Harridon mentioned that the entities related to security are tortuous and their capital resources are intertwined and shared where in the case of Search & Rescue missions the organization that is responsible for the security of a nation was also tasked to actuate Search & Rescue missions [15]. This was concurred by another paper of Harridon that mentioned issues that were in existence were due to factors related to management which plausibly occurred as the organization has multi roles and not only focuses solely upon security [16].

VI. CONCLUSIONS

There are quite a number of Think Tanks in Malaysia and they functioned as institutions of knowledge, providing views, opinions, and stipulations based upon myriad subjects and issues. The bulk of their stipulations is driven by comprehensive and meticulous analyses of data and information that were gathered, be it primary or secondary sources. All of the Think Tanks in Malaysia, with regards to our non-exhaustive list, are inclined towards issues and entities related to national economics and this in hand portray a sense of civic duty among all of them.

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AUTHORS

First Author – Mohd Harridon, Aviation Physical Fitness Cluster Universiti Kuala Lumpur Malaysian Institute of Aviation Technology, mdharridon@unikl.edu.my

Second Author – Farhan Abdullah, Sky Orbital Centre for Human Advancement (SOCHA)

Third Author – Nurhayati Mohd Nur, Aviation Physical Fitness Cluster Universiti Kuala Lumpur Malaysian Institute of Aviation Technology
A Tropical River Discharge Response To Land Use Land Cover Change

Abigail Chepkurui 1, Kigen Charles 1 and Nunow Abdi 2

1 Department of Geography and Environmental Science, Moi University
2 Department of Geography and Environmental Science, Moi University

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Abstract- River discharge is a function of land use land cover (LULC) among others within a given watershed. The watersheds in Kenya are rapidly changing due to the expansion and intensification of agriculture thus influencing river discharge. The study was conducted in Chepkaitit and Moiben Rivers watershed located along Trans Nzoia, Uasin Gishu and Elgeyo Marakwet counties in Kenya. The specific objective was to determine how change in LULC influences the river discharge under three scenarios of the current, 100% agriculture and 100% forest LULC. The LULC change analysis data used Landsat satellite imagery downloaded from USGS website while the SWAT model was used in river discharge analysis. The weather data was downloaded from “Global Weather data for SWAT” website and DEM (slope data) downloaded from USGS website while model output calibration used SWAT-CUP. The study also found out that changes in the LULC significantly influenced the river discharge with R² of 0.96 at p = 0.00001 at a significant level of 0.05. The change in river discharge was more pronounced in April where scenario 2 river discharge varied by -28.51% and 19.57% for scenario 3. The study concluded that the significant changes in LULC influenced river discharge significantly with synchronized flow under forest cover.

I. INTRODUCTION

The livelihood of East Africa depends majorly on agriculture. Therefore, in order to meet the demand for land, natural forests have been substituted with human settlement, urban centres, farmlands and grazing land (Maitima, et al., 2009). Loss of indigenous forests on streams that were originally in forested catchments and their subsequent conversion to agricultural use (e.g. in East Africa) is one of the major threats to surface water quality (FAO, 2010). Major water catchment areas in Kenya have lost their forest cover over time (World Bank, 2007). Deforestation according to Bonan, et al., (2004), changes the hydrological, geomorphological and biochemical states of streams. Anthropogenic changes in vegetation generally results in increased discharge because root density and depth have been reduced by agricultural activities (Canadell, et al., 1996). Additionally, a reduction in dry season flow is often cited as a consequence of deforestation (Liu, et al., 2015). There is a common argument that forests act both as ‘pumps’ through enhanced evapotranspiration (ET) rates and as ‘sponges’ through increased infiltration rates and soil moisture retention (Bruinjzeel, 2004; Arancibia, 2013). Forested watersheds therefore exhibit smaller streamflow rates than watersheds dominated by other managed land uses during and after a rainfall event. Forest cover loss results in changes in albedo, reduction in aerodynamic roughness, reduction of leaf area, and reduction in rooting depth, consequently causing a reduction in evapotranspiration (ET) which subsequently affects streamflow (Costa, et al., 2003; Farley, et al., 2005).

Odira, et al., (2010) and Gitau (2021) in their studies on Nzoia River concluded that deforestation in the catchment region affects stream flow in that during the rainy season, stream flow rate increases compared to when there is forest cover. In a study by (Mwetu 2019), in Njoro River in Kenya, it was also observed that with increased reduction in land cover in the river upper catchment, there was a reduced average annual discharge.

However, this is not conclusive since there is still a debate in looking at the complex relationship between forest and water resources (Ellison, et al., 2012, Lacombe, et al., 2016, Filoso, et al., 2017). Therefore, there was a need to assess how loss of forests, for other land uses, has impacted on Moiben and Chepkaitit rivers. The aim of the study is to model the influence of LULC on rivers Chepkaitit and Moiben water discharge using Soil and Water Assessment Tool (SWAT).

II. METHODS AND MATERIALS

2.1. Area of Study
The area under which this study was carried out is Chepkaitit and Moiben Rivers watersheds found within the Nzoia River basin in Kenya (Figure 1). The watersheds are located along Uasin Gishu, Trans Nzoia and Elgeyo Marakwet counties. Chepkaitit and Moiben...
Rivers are located between the coordinates 35°020’01.5” - 35°07’57.6” E and 1°02’18.1” - 0°55’06.9” N (WGS 84). It forms part of the upper catchment of the 12 903 km² Nzoia River watershed. The western escarpment of Cherangani hills forms an important source to Moiben and Chepkaitit rivers, Chebiywo, et al., (2004).

The Moiben and Chepkaitit Rivers originate on the western side of the Cherangani hills escarpment at 2400 m asl. Chepkaitit River originates from Mt. Elgon and the Western part of Cherangany hills forest ecosystems. Moiben River on the other hand is approximately 81 km long from its source in the Kipkunnur forest to its confluence with the Kapolet River, where they join to form the larger Nzoia River. The rivers join Nzoia, which drains to Lake Victoria (GoK, 1973). The land-use systems and practices in the basin broadly range from forestry, small-scale farming to large-scale mechanized agriculture. The basin is an area of high agricultural potential and is densely populated, which influences land use. The river drains a forested area at its upper reaches before entering a valley where mixed farming is practiced.

2.2. Soil and Water Assessment Tool (SWAT) Model

The Soil and Water Assessment Tool (SWAT) is a model of small watershed basin that simulates the quantity and quality of surface and ground water and foretells the environmental impacts of land use, land management practices and climate change. The flow of water in and out of the hydrological system, informs all the processes in the SWAT model. Daniel, et al., (2011) postulated that SWAT is deterministic, continuous watershed model that operates on daily and hourly basis. SWAT model was developed by the Agricultural Research Service of the United States Department of Agriculture. It can model changes in the hydrologic response of the catchment, water quality, and erosion and estimating the effects of Land Use changes. In order to model a hydrological unit, entire catchment is divided into sub catchments which are further divided into hydrologic response units (HRU) based on land use, vegetation and soil characteristics (Arnold, et al., 2013; Neitsch, et al., 2011)). SWAT then estimates run off of each HRU separate and then the total runoff for the entire basin. Master water balance approach is used in SWAT model to compute run off volumes and peak flows (Arnold, et al., 1998) and is expressed as equation below;

\[ SW_i = SW_0 + \sum_{i=1}^{t} (R_{day} - Q_{surf} - E_a - w_{seep} - Q_{gw}) \]

Where \( SW_0 \) is initial soil water content and \( SW_i \) is the final soil water contents on day \( i \). All other measurements are taken in millimeters and time (t) is in days. The equation subtracts all forms of water loss on day \( i \) from precipitation on day \( i \) (\( R_{day} \)) including surface runoff (\( Q_{surf} \)), evapotranspiration (\( E_a \)), loss to vadose zone (\( w_{seep} \)) and return flow (\( Q_{gw} \)) (Neitsch, Arnold et al. 2009). By manipulating this equation, the model can predict changes in variables of interest like runoff and return flow. The input data that is used in the model include land cover map, Digital Elevation models (DEM), channel geometry and soil Map (Srinivasan, Arnold 2012). Hydrological modeling is then done and output generated.

2.3. SWAT Modeling Process

The preliminary step was the definition of the slope, soil, LULC parameters, and climatological data in databases (dbf tables). Each table had to be defined clearly using the nomenclature provided in the SWAT user’s manual. The watershed delineation process was conducted and extracted the watershed, sub-divided the watershed into hydrological response units and built the streams and the stream
outlets using the DEM. The SWAT model generated 19 hydrological response units (HRU) from the sub-watershed (figure 2). In the creation of these HRUs, all the required data for hydrological simulations of the watershed were determined for each unit. Then for each land use, different soil types and slope associated with each were selected. For the LULC and soil definition, shape files were added in ArcGIS and linked to the SWAT database. To use the maps provided, the SWAT interface required a table linking the values represented to types already defined in the hydrological model.

![Figure 2: The stream, HRUs and the stream outlets](image)

### 2.3.1. LULC Data

The LULC spatial data was sourced from Landsat satellite imagery downloaded from USGS website [https://earthexplorer.usgs.gov](https://earthexplorer.usgs.gov). The downloaded data was in WGS 1984 and was projected to UTM Zone 37N. The data for LULC the year 1980 used Landsat 2 with a resolution of 60 meters and 180/059 path/row scene covered; for the year 2000 Landsat 7 with a resolution of 30 meters was used and for year 2020 Landsat 8 satellite image with a resolution of 30 meters were processed. For both Landsat 7 and Landsat 8, three imagery scenes were downloaded covering paths/rows 170/059 (zone 36N), 169/059 (zone 37N) and 169/060 (zone 36N). Figure 3 shows the satellite images used in the three time periods of 1980, 2000 and 2020. The year 1980 LULC data used Landsat 2 satellite imagery of 16th May 1979 as this is the closest to 1980 without clouds. The Landsat 2 images have 4 bands and the useful bands for vegetation analysis are band 4 (green band), band 5 (red band) and band 6 (blue band) all with a 60 meters ground resolution. The year 2000 LULC data used Landsat 7 satellite images of 27th January 2000 for path/row 169/059 and 169/060 and 6th February 2000 for path/row 170/059. The Landsat 7 images have 7 bands and the useful bands for vegetation analysis are band 4 (green band), band 5 (red band) and band 6 (blue band) all with a 30 meters ground resolution. The year 2020 LULC data used Landsat 8 satellite images of 11th March 2020 for path/row 169/059 and 169/060 and 7th January 2020 for path/row 170/059. The Landsat 8 images have 9 bands and the useful bands for vegetation analysis are band 3 (green band), band 4 (red band) and band 5 (blue band) all with a 30 meters ground resolution.
Figure 3: The downloaded imagery data footprint

The satellite imageries processing and analysis was done using ArcGIS version 10.5. Using the three bands for vegetation analysis, composite images were generated and extraction of the area of study done (figure 4). The satellite images classification was performed through onscreen digitization. Further, processing and analysis of these spatial data was carried out in the same environment. Other LULC data required for SWAT model were generated in ArcGIS. This applies to the LULC data for scenarios 2 (100% forest cover) and scenario 3 (100% agriculture). New shapefiles were generated by coding the entire basin shapefile accordingly.

Figure 4: Extracted area of study

2.3.2. Climate Data
The SWAT model makes use of weather data namely temperature, precipitation, wind, relative humidity and solar radiation parameters among others. The weather data was downloaded from the “Global Weather data for SWAT” website (https://globalweather.tamu.edu/). This weather data was downloaded by selecting the location of interest in the map providing email where the download link is sent. For this research the climate data was requested in Arc-SWAT format. The used weather data was from Jan 1979 – Dec 2013.

2.3.3. Soil Data
Soil data is a critical input for any hydrological simulation model (Nam, et al, 2010; Melesse, 2006).

Figure 5: Map showing the different classes of soil

Soil properties (commonly texture and hydraulic conductivity) affect hydrologic processes such as infiltration and lateral transport of water in the soil. The soil data used by SWAT is divided into two major groups according to their characteristics; physical and chemical. In this study, physical characteristics of the soil data was considered since they control the motion of water through the soil profile and thus have a major impact on the cycling of water within each hydrologic response unit (Arnold, et al, 2011). Soils were
generally classified into different hydrologic response units (which comprise soils with similar runoff potential under similar storm and surface cover conditions) based mainly on their infiltration characteristics. Processed and classified spatial soil data for use in the SWAT model was downloaded from FAO website (https://swat.tamu.edu/media/116406/af_soil.zip) (figure 5).

![Figure 6: map showing the elevation of the area](image)

2.3.4. Slope Data
The slope data of the watershed was derived from DEM data to be downloaded from USGS website (https://earthexplorer.usgs.gov). A Digital Elevation Model (DEM) of the study area (figure 6) at a 30 by 30 meters resolution was obtained. The DEM was used to delineate the topographic characterization of the watershed and to show the hydrological parameters of the watershed such as the slope, flow accumulation, flow direction, and stream network.

2.4. SWAT Setup
Table 1: The LULC scenarios used in SWAT model
The SWAT model was run from 1st January 1979 – 31st December 2013 on monthly basis. The SWAT model warm-up period was 3 years i.e. 1979 to 1981. The SWAT data used comprised of slope, soil, weather and LULC. Three SWAT model scenarios were generated each using different LULC data. The base scenario used the 1980 LULC; while scenario 2 assumed 100% Montane forest LULC and scenario 3 assumed 100% agriculture LULC (table 1).

2.4.1. Model performance
SWAT output calibration was conducted in SWAT CUP. The SWAT CUP is an acronym that stands for SWAT Calibration and Uncertainty Program that was developed for automatically computing sensitive model parameters. Sequential uncertain fitting ver-2 (SUFI-2) algorithm in the SWAT-CUP was used for this function. The SUFI-2 captures as many optimal simulations as possible that are within 95% prediction uncertainty (95PPU). Evaluation of the model performance, the coefficient of determination ($R^2$) statistic was applied.

III. RESULTS

3.1. LULC change

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Montane forest</th>
<th>Plantation forest</th>
<th>Bushland</th>
<th>Agriculture</th>
<th>Wetland</th>
<th>Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base</td>
<td>17.60</td>
<td>1.69</td>
<td>28.61</td>
<td>46.50</td>
<td>5.57</td>
<td>0.04</td>
</tr>
<tr>
<td>2</td>
<td>100.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>
The LULC of the years 1980, 2000 and 2020 were processed from the Landsat satellite imagery and analysed in ArcGIS. The spatial data showed the kinds and extent of LULC in the watershed in the times under study (figure 7). The identified LULC were montane forest, bushland, tea plantation, cropland, plantation forest, wetland, woodlot and urban area.

Figure 2: LULC of the years 1980, 2000 and 2020 in

The spatial LULC results indicate that the “Bushland” category has drastically reduced in 2000 and 2020 after domination in the northern section of the watershed in 1980 with a corresponding expansion of “Cropland”. The “Wetlands” appear to have reduced with time from continuous to broken sections in 2020. Notably, new LULC that appeared in 2000 are the “Urban areas” and “Tea plantation”. The “Montane forest” spatial distribution is more or less the same unlike the “Plantation forest” which is expanding to the northeast from southeast of the watershed. The LULC trend was tabulated and the changes (km²) with time (table 2) were quantified. The results from the table 2 indicate that there has been a significant change in the LULC in the watershed between 1980 and 2020. It is evident from the study that there was a reduction in the size of land under montane forest, bush land and wetland. Montane forest area reduced by 10% from year 1980 to 2000, and eventually decreased by 13% by the year 2020.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crops</td>
<td>1006.23</td>
<td>1680.35</td>
<td>1701.55</td>
<td>674.11</td>
<td>695.31</td>
<td>67</td>
<td>69</td>
</tr>
<tr>
<td>Montane forest</td>
<td>380.81</td>
<td>340.99</td>
<td>330.79</td>
<td>-39.82</td>
<td>-50.03</td>
<td>-10</td>
<td>-13</td>
</tr>
<tr>
<td>Plantation forest</td>
<td>36.50</td>
<td>39.70</td>
<td>48.37</td>
<td>3.19</td>
<td>11.86</td>
<td>9</td>
<td>32</td>
</tr>
<tr>
<td>Tea plantation</td>
<td>0</td>
<td>1.61</td>
<td>1.99</td>
<td>1.61</td>
<td>1.99</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Urban area</td>
<td>0</td>
<td>5.44</td>
<td>7.73</td>
<td>5.44</td>
<td>7.74</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Woodlot</td>
<td>0</td>
<td>0</td>
<td>2.42</td>
<td>0</td>
<td>2.42</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>Water</td>
<td>0.84</td>
<td>1.65</td>
<td>1.54</td>
<td>0.80</td>
<td>0.69</td>
<td>95</td>
<td>82</td>
</tr>
</tbody>
</table>

Table 2: The LULC changes between year 1980, 2000 and 2020
The wetland declined by 53% and 67% in the years 2000 and 2020 respectively, compared to that of the year 1980. There is a very great change in the area of bush-land. It reduced by 94% from year 1980 to 2000 and by 2020 it had reduced by 95%. The area under water on the other hand, increased from 1980 to 2000 by 95% and then reduced to 82% in 2020.

In contrast, there was an increment in the size of land under crops (cropland), where in the year 2000, there was an increase of 67% and as at 2020, the increase was 69% compared to 1980. Additionally, it is also noted that the area under plantation forest has increased such that by 2000, it had increased by 9% and by 2020 it had increased by 32%, comparing it with the 1980 value. It is also noted that the tea plantation and urban areas which did not exist in the year 1980 emerged in the year 2000 and its size had increased to 0.1% and 0.4% respectively in the year 2020. The study area is thus seen to have witnessed a reduction in the montane forest, bush land and wetland. This reduction could be attributed to deforestation to create land for crop farming, tea plantation and creation of urban space. It is thus seen that deforestation is taking place in favour of other land uses such as tea plantation, urban centres and crop land. The area has seen the introduction of urbanization and tea plantation in the area, whereas at the same time the montane forest has reduced. This then implies that there is increased deforestation in the region from the year 1980 to 2020. The plantation forest could be linked to the initiative by the government urging people to plant trees and at times giving them incentives to do so. The study also indicated a progressive reduction of wetland from 120.5km² in 1980 and to 39.5 km² in 2020. This is indicative that most of the wetlands have been reclaimed for agricultural purposes.

Studies in Moiben and Chepkaitit rivers’ watershed have also revealed from the analysis that the region has been subjected to a gradual process of conversion to other LULC due to high population pressure. The period 1980 – 2020 indicated a significant change in LULC. While the crop land is increasing, the bush land, forest and wetlands are reducing. This is an indication that deforestation is being carried out in the region to create room for cultivation. Further, the wetlands also have been reclaimed to create room for agriculture. It means then that the population has increased therefore, there is need to produce more food, and this creates pressure which drives LULC changes as observed by (Cheruto, et al, 2016).

### Table 3: River discharge (cm/s) for the three LULC scenario

<table>
<thead>
<tr>
<th>Month</th>
<th>Base Scenario</th>
<th>Scenario 2</th>
<th>Scenario 3</th>
<th>Scenario 2 % Change</th>
<th>Scenario 3 % Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>24.53</td>
<td>30.50</td>
<td>21.11</td>
<td>24.36</td>
<td>-13.92</td>
</tr>
<tr>
<td>Feb</td>
<td>15.41</td>
<td>17.91</td>
<td>14.30</td>
<td>16.17</td>
<td>-7.21</td>
</tr>
<tr>
<td>March</td>
<td>15.95</td>
<td>15.67</td>
<td>16.81</td>
<td>-1.75</td>
<td>5.42</td>
</tr>
<tr>
<td>April</td>
<td>58.62</td>
<td>44.83</td>
<td>70.09</td>
<td>-23.51</td>
<td>19.57</td>
</tr>
<tr>
<td>May</td>
<td>116.36</td>
<td>100.77</td>
<td>128.50</td>
<td>-13.40</td>
<td>10.43</td>
</tr>
<tr>
<td>June</td>
<td>144.57</td>
<td>133.95</td>
<td>153.05</td>
<td>-7.35</td>
<td>5.86</td>
</tr>
<tr>
<td>July</td>
<td>187.62</td>
<td>180.47</td>
<td>194.18</td>
<td>-3.81</td>
<td>3.50</td>
</tr>
<tr>
<td>Aug</td>
<td>224.31</td>
<td>223.69</td>
<td>224.75</td>
<td>-0.28</td>
<td>0.20</td>
</tr>
<tr>
<td>Sept</td>
<td>165.96</td>
<td>184.79</td>
<td>152.11</td>
<td>11.35</td>
<td>-8.35</td>
</tr>
<tr>
<td>Oct</td>
<td>113.20</td>
<td>128.74</td>
<td>102.02</td>
<td>13.73</td>
<td>-9.88</td>
</tr>
<tr>
<td>Nov</td>
<td>80.71</td>
<td>90.38</td>
<td>74.35</td>
<td>11.97</td>
<td>-7.88</td>
</tr>
<tr>
<td>Dec</td>
<td>44.72</td>
<td>54.41</td>
<td>38.36</td>
<td>21.66</td>
<td>-14.23</td>
</tr>
</tbody>
</table>

3.2. Impacts of LULC change on river discharge

The results of the modelled river discharge (table 3) are presented on monthly basis for the entire period under study. The river discharge is not uniform throughout the year having minimum of 15.41cm/s in the month of February and maximum of 224.31cm/s in the month of August. The lower values indicated the dry months while the higher values indicated the wet months.

The SWAT-CUP calibration yielded the coefficient of determination (R²) of 0.96 (figure 8) indicating a very good SWAT model performance. According to Moriasi, et al, (2007), R² is a standard regression technique that is used to determine the strength of linear relationship between simulated and measured (observed) data. R² values ranges from 0 to 1 which represents the trend between the observed and simulated data. R² Values greater than 0.5, are considered acceptable. This is an affirmation that the hydrological processes were realistically modelled in this study.
3.2.1. Scenario 2: 100% forest LULC
The stream hydrograph is more or less the same as the base scenario with differences in the rate of water flow. The stream flow varies from the base scenario in both positive in January, February and September – December while it was negative in March to August (figure 9). In the month of January, the stream flow rates increased by 24.36% while the maximum decrease is in the month of April by 23.51%. This means that the presence of trees reduces the surface water run-off by increasing retention time thereby encouraging water infiltration.

3.2.2. Scenario 3: 100% agriculture LULC
In this scenario, the stream-flow varies from the base scenario in flow rate though the hydrograph pattern is identical. The percentage change is positive between March and July while the negative changes occur both in January, February and September – December (figure 10). In the month of December, the stream flow rates decreased by 14.23% while the maximum increase is in the month of April by 19.57%. This means that the agricultural land generally encourages excessive surface water run-off by reducing retention time thereby discouraging water infiltration.
IV. DISCUSSION

The results of the SWAT model indicated that the river discharge is different for different months due to the difference in the seasonal weather pattern and the different LULC scenarios. The simulations when the forest was assumed to be 100% showed that the river discharge during the wet months was very low compared to the dry months. This means that when the watershed is highly forested, the river discharge is not affected by run-off that occurs during rainy season. It thus holds that forest prevents the excessive run-off. The forest vegetation increases water retention time thereby allowing infiltration. This study then agrees with what other researchers have observed in other regions. Andreaassian (2004) indicates that the increase of the forested area causes a decrease of the maximum peak flow and an increment in the base flow discharge values in a study in Russia. These changes could be attributed mainly to deviations in evapotranspiration, surface roughness and water infiltration rate in the soil. At 100% agriculture on the other hand, it showed very high river discharge during the rainy season. The reason for this is due to lack of forest to prevent excessive run-off. The simulated scenarios then agrees with the theory that forests are sponge-like, in that it holds water during the rainy season and releases it during the dry period. Deforestation according to Bonan, et al., (2004), changes the hydrological, geomorphological and biochemical states of streams. Changes in vegetation generally results in increased discharge because root density and depth have been reduced by agricultural activities (Canadell, et al, 1996). Forest floors have leaf litter and porous soil which easily accommodate intense rainfall as infiltration takes place slowly until the soil is saturated. The trees funnel water into the underground aquifers where it will be stored to supply rivers during drought. Tree leaves also hold some rain water that evaporates directly to the atmosphere. Run-off is thus controlled by this nature of trees and therefore soil is protected from being eroded into the rivers. It holds therefore that deforestation will highly lead to increased river discharge during the rainy season and reduced river discharge during the dry weather seasons (Liu, et al., 2015).

Land use was observed to influence the soil hydrological properties which are measured by the movement of water in the soil. Compaction of soil interferes with the movement of water, increases soil bulk density and reduces hydraulic conductivity and infiltration (Nzitonda, et al, 2019). The least river discharge for agricultural land during the dry period was due to the low levels of infiltration and excessive run-off during the wet season. The low infiltration rate is due to compaction of lower soil horizons resulting from continuous tillage of agricultural land (Ankeny, et al, 1990). This compaction also increases the bulk density of the soils (Logsdon, et al, 1990) and thus will determine the run-off volume. Because of the low levels of infiltration, the replenishment of the groundwater was very low and thus reduced river discharge during the dry seasons. The scenario for the agricultural land indicates that water interception in the sub-catchment is low and thus meaning less time for infiltration. This is mainly caused by decrease in forest cover and increase in croplands therefore reducing rain water interceptions leading to increase in surface run-offs in the sub-catchment (Olang’, 2009). Forests are less compacted and that is why they have high infiltration rates and high hydraulic conductivity compared to other land uses (Nzitonda, et al, 2019).

5.1. Conclusion

The modeling of data sets using the SWAT-CUP under two scenarios, scenario 2 (100% forest LULC) and scenario 3 (100% agriculture LULC), showed an impact in the river discharge. The LULC changes along the watershed led to changes in the river flow discharge rates. The changes in Land Use from forest land to agricultural land led to changes in run-off and thus increase in river discharge during the wet months. During the dry months, the flow was very low in agricultural lands because the underground aquifers were not replenished during the wet months due to excessive run-off. The forested areas on the other hand were opposite to that of the agricultural land. Under this situation, the infiltration occurred during the rainy season and thus the river discharge was normal.

5.2. recommendations

The study recommends that: the impact of LULC changes to the river discharge is not impressive and thus, the study recommends that deforestation should be controlled by all means. The locals, the environmentalists and the forest department should all take their parts. The laws that govern forest resource should be re-visited and thorough routine checks be done. Forest management authorities should normalize disciplinary measures through penalties for the policy breakers and the authorities should ensure that reforestation be done in the government forest lands that have been degraded. The owners of the lands also living at the catchment of the rivers should be encouraged to plant more trees in their farms, as the trees are good protectors of the soil. Agroforestry should be encouraged always.
The relevant authorities responsible for watershed and catchment management also, should encourage people to plant trees that can provide fruits, medicine, fodder, live fence and for aesthetics on their farms. When these trees will be planted in plenty, it will assist in conserving soil and water, apart from its primary purpose of providing the primary needs.

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AUTHORS

First Author – Abigail Chepkurui, abigailchep@gmail.com, +254 717504534
Role And Significance Of Genetic Animal Resources In Achieving The Goals Of Sustainable Development Of Libya

Ali Asanousi Musbah
Phd,candidate
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Abstract- Existence, preservation and sustainable use of genetic resources is crucial for the biodiversity of a given country. Genetic resources represent a key component of biological diversity. The very term genetic resources refers to any biological material that contains genes or metabolic material that can be derived from genes. The term genetic resources can be defined as the total diversity of DNA structure in species that are used directly or indirectly by humans. The term genetic resources refers to any biological material that contains genes and/or metabolic material that can be derived from genes. They fall within the scope of the Nagoya Protocol whenever they are used for research or product development.

Index Terms- sustainable.resources.genetic.biological

I. INTRODUCTION

In 2007, the international community adopted the Global Action Plan for Animal Genetic Resources, which consists of twenty-three strategic priorities aimed at combating the reduction of animal genetic diversity and the sustainable use of animal genetic resources. The implementation of the Global Action Plan is expected to contribute to the achievement of Millennium Development Goals 1 (eradication of extreme poverty and hunger) and 7 (ensuring environmental sustainability).

The concept of sustainable use of genetic animal resources has an economic, ecological and socio-cultural dimension. Sustainable use of animal genetic resources also contributes to food security, rural development, increased employment opportunities and improved living standards of breeders. Supporting breed breeding through better infrastructure, services, animal health care, marketing opportunities and other interventions would make a significant contribution to the sustainable use of animal genetic resources.

Sustainable use of animal genetic resources implies the use and improvement of breeds that have a high level of adaptability to the prevailing environment. It also includes the application of healthy genetic principles for the sustainable development of breeds and the sustainable intensification of the production systems themselves. Sustainable use and genetic improvement rely on access to a wide range of genetic resources.

SUBJECT OF RESEARCH

The subject of this dissertation is research related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya. Within the framework of this doctoral dissertation, a special focus will be directed at considering the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya, i.e. researching the possibilities for the development and application of a modern model of agricultural production, with the possibility of as much preservation of animal genetic resources as possible within the framework of sustainable development of Libya.

OBJECTIVES OF THE RESEARCH

The main goal of the subject research is to review the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya, that is, to comprehensively review the key aspects of genetic animal resources in the context of achieving the goals of sustainable development of Libya.

Scientific objective

The scientific goal of the research is reflected in the confirmation and expansion of previous scientific knowledge about the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya. This was achieved through: - defining concepts, phenomena and processes related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya. - after describing, the classification of terms, phenomena and processes related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya was carried out. - the results of this research can serve as a basis for further scientific study of aspects of the research subject in different countries.

Social goal
The social goal of the research is reflected in a realistic assessment of the role and importance of genetic animal resources in achieving the goals of sustainable development in Libya.

**RESEARCH HYPOTHESES**

The work is based on general and special hypotheses derived from the subject of research. General hypothesis:

**H0:** If genetic animal resources are managed in an adequate and comprehensive way, a contribution is made to achieving the goals of sustainable development, i.e. a contribution is made to the creation of conditions for the development of a society that meets human needs with available resources, without endangering natural systems and the environment.

**Special hypotheses:**

**H1:** Increasing investment in rural infrastructure, agricultural research and advisory services, technology development and gene banks, with the aim of improving agricultural production capacities in rural areas of developing countries, contributes to reducing hunger, achieving food security and improving nutrition and promoting sustainable agriculture.

**H2:** If the conditions for exploiting the biodiversity of animal resources are provided, production is improved and food security is ensured, that is, agricultural producers have the opportunity to improve their breeds and adapt the livestock population to the changing environment and changing market demands.

The deductive method made it possible to derive individual judgments, conclusions. The following research methods were used during the preparation of the dissertation:

- **Dialectical method** that observes genetic animal resources and their role and importance in achieving the goals of sustainable development of Libya.
- **The inductive method** made it possible, based on the analysis of individual facts and knowledge, to generalize and form new facts related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya or assertions based on general judgments, that is, general logical features between the researched concepts. It also serves to discover new knowledge, prove new facts, or new laws. As part of the deductive method, its elements were also used, which are the procedures of analysis, synthesis, abstraction, generalization and specialization;
- **The method of content analysis**, which includes the analysis of available data, books, scientific works, operational documents and other publications, related to genetic animal resources and their role and importance in achieving the goals of sustainable development of Libya.
- **The comparative method** looked at the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya, through a comparison with the state of development of genetic animal resources and their contribution to achieving the goals of sustainable development in countries in the North African region.
- **The research method** was used to collect data related to the role and importance of genetic animal resources in achieving the goals of sustainable development in Libya.

The research was conducted on a suitable sample of respondents, who are employed in organizations related to sustainable development in Libya. In determining the number and type of characteristics of the sample, we started from sociological knowledge that the professional status of certain employees in organizations affects their attitudes regarding the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya.

Research results have scientific and social significance.

1. The scientific contribution is reflected in the confirmation and expansion of previous scientific knowledge about the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya. This was achieved through:
   - defining terms, phenomena and processes related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya.
   - after describing, the classification of terms, phenomena and processes related to the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya was carried out.
   - the results of this research can serve as a basis for further scientific study of aspects of the research subject in different countries.

2. The social contribution is reflected in the realistic perception of the role and importance of genetic animal resources in achieving the goals of sustainable development of Libya.

The term resources refers to various means or assistance used to achieve a certain goal or to satisfy certain needs. Also, resources can be viewed as a set of elements that are available for the realization of certain needs or for the performance of certain activities, such as natural, human, animal, forestry and others. The term resource comes from the Latin language. Resources represent space, material and energy that benefit human society, natural resources and natural resources. Nature provides goods, while in human nature is the desire to establish control over natural goods and the need to adapt them to one's own requirements. Both man and nature strive to make goods or resources available. In situations where there is no responsibility regarding the rational use and distribution of resources and wealth arising from them, conflicts and the destruction of what they benefited from occur.

Resources that are in the regime of joint ownership are characterized by the fact that they are managed by a clearly and precisely defined group of users. An example of this type of resource is irrigation systems or grazing land for livestock.
Based on their availability, resources are classified into ubiquitous resources, which are found everywhere in the environment, regardless of location, and localized resources, which are available only in certain places. From the perspective of their renewal potential, resources are classified into non-renewable resources, renewable resources and potentially renewable resources.

Non-renewable resources are resources that are characterized by the existence of fixed stocks, i.e. unchanged size of total "reserves" within a period measured by human age (they are regenerated only at the level of geological age - measured in millions of years, not at the human time level). Examples of non-renewable resources are metal or non-metal ores, oil fields, natural gas fields, coal deposits and other fossil fuel energy resources. A fundamental question that arises with non-renewable resources is the optimal rates of extraction over time: should the resource be used immediately, gradually, or not at all? Non-renewable resources are divided into recyclable and non-recyclable.

Renewable resources are resources characterized by the fact that, after exploitation, they can return to their previous stock level through natural processes of growth or replenishment, that is, they are naturally renewed in a time interval that is relevant for exploitation. Although it is possible to deplete a renewable resource, this will not happen if the rate of natural regeneration or growth of the resource exceeds the rate of exploitation or exploitation. Examples of renewable resources are grasslands, forests, rivers, air, fish stocks and wildlife populations.

For the use of renewable resources to be sustainable, the rate of their consumption should be maintained within the capacity of natural systems to regenerate (or renew) over a period relevant to the human population. Potentially renewable resources are resources that are characterized by the fact that they are not completely non-renewable, but their renewal period is very long, "that is, they need a renewal time that is measured in generations."

In the case of potentially renewable resources, natural processes provide continuous, but limited and often uncertain renewal at a given moment and for a certain period of time. Examples of potentially renewable resources are the quality and fertility of the soil, the level of groundwater, the amount of precipitation, or the assimilative capacity of the environment.

Natural resources represent the common good and common wealth. The use, economic application and economic valuation of natural resources must be planned and purposefully controlled. Regardless of the type, structure and individual quantity, natural resources represent the basis for the future economic and economic development of a certain country.

There is also a part of natural resources that must remain outside the economic and economic flows and that must be consumed in a controlled manner and preserved for the future. This is especially true for hard-to-renew and non-renewable natural resources. It is necessary that access to natural resources includes the definition of a policy and strategy for their sustainable use, including the regulation of the regulatory framework for their adequate implementation. Natural resources are usually considered to be everything that originates from the Earth, i.e. soil, plant and animal life, water, oil, metals, water and others.

Currently, the problem of depletion of natural resources is becoming more and more pronounced. Depletion of the potential of natural resources is expressed in the reduction of natural resources to a level that does not meet the needs of humanity, its technical capabilities and standards of safety of natural systems. Exhaustion of natural resources makes their further development economically and ecologically impractical. With wasteful use, some types of renewable resources may disappear, losing their ability to self-renew. For example, a horizon of arable soil with a thickness of about 18 cm, under favorable conditions, is renewed in 7,000 years.

Intensification of industrial interference in natural processes, consumerist, utilitarian, greedy attitude towards nature, its resources and wealth destroys the symbiosis of human society and nature. Production growth cannot be achieved due to the depletion of natural resources and environmental pollution, because not only the development of production, but also the existence of life on Earth depends on their condition.

The results of the research within the framework of the conducted comparative analysis showed that in Egypt the policy of protection and preservation of livestock biodiversity is a priority within the sustainable development program. Local livestock breeds are of crucial importance for sustaining life in rural areas, especially in marginal areas of the country that have relatively low requirements in terms of management, health care and nutrition. Breeding of indigenous breeds of cattle, apart from having a social and economic impact, is also a part of Egyptian tradition and culture in rural areas of Egypt. Management of genetic animal resources in the local community implies active participation and support from the owners and users of animals.

Taking into account the performance of the countries included in the research in the part related to the state of development of genetic animal resources and the achieved performance related to the achievement of the goals of sustainable development, the comparative analysis showed that adequate and comprehensive management of genetic animal resources contributes to the achievement of the goals of sustainable development. That is, it contributes to the creation of conditions for the development of a society that meets human needs with available resources, without endangering natural systems and the environment. Based on the above, it can be concluded that the general hypothesis within this research is confirmed and correct.

As part of the research, it was determined that in terms of the achievement of Sustainable Development Goal 9 - Build resilient infrastructure, promote inclusive and sustainable industrialization and encourage innovation in 2021 in Libya, the result has stagnated or grown by less than 50% of the required rate, with the main challenges they remain. In Egypt, too, the result stagnated or grew by less than 50% of the required rate with significant challenges remaining, while in Tunisia and Morocco the result improved moderately but not enough to reach the target with significant challenges remaining.

The above shows that in 2021, Libya achieved the worst performance in terms of achieving the goal of sustainable development, which refers to the construction of resilient infrastructure, the promotion of inclusive and sustainable industrialization and the encouragement of innovation.

Taking into account the performance of the countries included in the research in the part related to investments in rural infrastructure, agricultural research and advisory services, development of technology and gene banks, and the achieved performance related to the achievement of the goals of sustainable development, the comparative analysis showed that the increase
investments in rural infrastructure, agricultural research and advisory services, technology development and gene banks, with the aim of improving agricultural production capacities in rural areas of developing countries, contributing to reducing hunger, achieving food security and improving nutrition and promoting sustainable agriculture. Based on the above, it can be concluded that the first auxiliary hypothesis within this research is confirmed and correct.

The risk of potential loss of natural habitats and biodiversity, which are part of the common heritage of all people on the planet and which ensure global food and water security and mitigation of the consequences of climate change, must be controlled and under constant supervision by undertaking appropriate protection measures and preventive actions in order to preserve biodiversity in to all parts of the world. In the broadest sense, it can be said that without the life activities of numerous diverse organisms, the global biogeochemical cycles in nature could not take place, that is, the cycle of water, oxygen, carbon dioxide, nitrogen, sulfur, phosphorus and others. Without the existence of total biodiversity, it is difficult to imagine the balanced functioning of the biosphere. Economic profit from preserved biodiversity is recognizable nowadays in all social activities, especially in urban civilization activities.

The research showed that the performance of the countries included in the comparative analysis - Egypt, Tunisia and Morocco compared to Libya, achieved better performance related to the achievement of sustainable development goals in the part related to the protection, restoration and promotion of the sustainable use of terrestrial ecosystems, sustainably forest management, combating desertification and halting and reversing land degradation and halting biodiversity loss. Namely, in Libya in 2021, the result improved moderately, but not enough to achieve the goal, with significant challenges remaining. The above shows that in 2021, Libya achieved the worst performance in terms of achieving the goal of sustainable development, which refers to the protection, restoration and promotion of the sustainable use of terrestrial ecosystems, sustainable forest management, the fight against desertification, and halting and reversing land degradation and halting the loss of biodiversity.

Taking into account the performance of the countries included in the research in the part related to the conditions for the use of the biodiversity of animal resources and the achieved performance related to the achievement of the goals of sustainable development, the comparative analysis showed that providing the conditions for the use of the biodiversity of animal resources contributes to the improvement of production and ensures food security, that is, agricultural producers have the ability to improve their breeds and adapt the livestock population to the changing environment and changing market demands. Based on the above, it can be concluded that the second auxiliary hypothesis within this research is confirmed and correct.

Bearing in mind the results of the conducted research for the further development of genetic animal resources in Libya, i.e. the improvement of the management system of genetic animal resources in order to ensure their contribution in achieving the goals of sustainable development and creating conditions for the development of a society that meets its needs with available resources, without endangering natural systems and life environment, it is necessary to provide greater state incentives through rural development financing programs, especially in areas with unfavorable climatic conditions and areas of protected nature where the development of ecologically sustainable agricultural systems is imperative, bearing in mind the broader social interest related to the preservation of natural resources that used by agricultural production. In this way, it would contribute to the preservation and protection of genetic resources and biodiversity as a whole, as well as the preservation of authentic local products and traditional technologies used in processing.

Genetic animal resources for agriculture and food represent the most important segment of the biological base for providing food for human needs in the world. Animal genetic resources contribute to income for a significant part of the world's population. Of particular importance for the survival and well-being of people in the world is the existence of a diverse genetic resource base. Also, genetic animal resources contribute to the efforts made to eradicate hunger in the world. Animal genetic resources are also important in the context of adapting to environmental, social and societal changes in the world, including climate change. Genetic animal resources represent the raw material basis for livestock farmers. They are also of particular importance for sustainable agricultural production. Namely, bearing in mind that when genetic animal resources are managed in an adequate way, they contribute to the improvement of agricultural production, i.e. increasing its productivity and generating a sufficient amount of food that can respond to the growing demand for food by the population in the world, including in Libya.

The research showed that in 2021, Libya achieved the worst performance in terms of achieving the sustainable development goal related to the protection, restoration and promotion of the sustainable use of terrestrial ecosystems, sustainable forest management, combating desertification and halting and reversing land degradation and halting the loss of biodiversity, as well as that Libya, along with Egypt, achieved the worst performance in 2021 in terms of achieving the goal of sustainable development, which refers to the strengthening of means of implementation and revitalization of the Global Partnership for Sustainable Development.

AUTHORS
First Author – Ali Asanousi Musbah  phd,candidate
The child centric and adult centric were in agreement with high level of living getting along in tune with vicious cycle of poverty and virtuous cycle of poverty

Philip kamei

Asstt. Prof.

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Abstract- The ode to childhood, the children first school is at home, everybody smile and love at the innocent face that reflect tension free and cry out only during the child stomach is empty and had sickness or aggravation. Children are incorruptible and innocent and honestas his wheel of development. A good wife will mould up and make a child grow up and get respect for both husband and wife. Childhood say from class KG to Class five. These childhood stage in a play attitude and are of enthusiastic type and they give less attention to their studies nevertheless private tuition or mother has to spare sufficient time to household chores along with eye on children, finding out time and energy, sitting together and solving mathematics and statistics together make a good mother. A good woman are those who makes the crown of her husbandalong with making children submissive. Together the child must be sticky toward parent. We should ensure and make time table for daily activity. Child must know the timing of study and reduce time for playing viz. football and volleyball. The taste, likeness, and preference of the children calibre, intelligent, strength and with the parent presenting the role of indifference curve in consumer theory (ordinal theory using IC). The indifference curve approach can be applied physically to child centric norm. Make their ward be loved by all teachers. Parent should love all children equally but some family say A, B, C, & D (all capital letter represented Individual family).

For instance ‘A’ family got six children the eldest boy was love both by parent. For others children less carefulness and are of looking after their future career and let them go and easy and at freewill, these 5 children needs equal attention as the support get by the eldest and are in secondary activities. Studentsmust respect their teachers in the college premises (compound) or city where they are passing by because student are getting the knowledge and wisdom, creating you to become some big persons getting white collar jobs in their life ‘child future lies on what sort of work (activity)you do today at home teachers and parent are solely responsible why student drop out and there is no seriousness in study as a consequence. The children when workforce needed them they are unprepared, unskilled and out of the jobs market. This lead to vicious and virtuous cycle of unemployment. Which means everyone future depends on how much we work today accompanied by hard work now; will pay as back when we becomes old and helpless to the point we can’t stand up and goes for nature’s cool (Number one and Two……etc., and also for food and drink we must feed them since their hand incision and sacking). Absence mindedness. Liking all eatables that are like by Children. They should know that ‘the fear of the teacher and respect for teacher invites teachers try to put his interest on which he is supposed to do. With full vigour is the beginning of acquiring knowledge and wisdom by students from his teacher.’ And later realise when someday they become teacher. We should never forget that acquiring know is an unending process.

Knowledge and wisdom, we need wealth like money, property, capital, tool, and machinery.

The life of children studying nursery, KG-1, KG-2 and class 1 and 2 etc. when the child grows up and at the level of class 5 and class 6. The mom centric child will go in love father and the true father teach them at home, get private tuition, and work day in and day to sponsor their ward and to study and become a good and better citizen. To find a source of money for a farmer, it depends on Cereals and Rabi crops, Horticulture crops, Commercial crops and Spice crops. For some tea plantation, keeping fisheries farm, Naspati farm, orange farm, piggery etc. Some striking lucky people got government jobs like lower primary teacher, upper primary teacher and teacher in Government High School. For unlucky few they get low profile jobs like peon, sweeper, cook, watchmen, lower division clerk and upper division clerk. Apart from this. Some are in Assam regiment, CRPF, Central Reserve Police Force. Children are like creamy layer of the sweet cakes and honey. Everyone admire children there are no racial discrimination of caste and creed. In respect of children. In Holy Bible Jesus openly said that heaven or his kingdom belong to their sinless nature and innocent look and graciousness. He prayed and blessed little children who comes to him. Child and ageing people need our action without our protection they might have loose living (Child labour and old age home) where they are dreaming about their home.

Index Terms- Innocent, discrimination, Aggravation, virtuous,centric, wisdom, ode, graciousness
I. INTRODUCTION

The impact and role of good parenting become true and last long with regard to honesty, discipline, respect to elder, and be humble even when we are right, for this world is a risky and nasty world. We should try to negotiate the divergent views between husband and wife and try not to argue when children are at home. A worldwide issues such as climatic condition, weather deteriorating, global crisis viz. carbon dioxide concentration increasing humidity of the planet earth, scarcity of fresh water etc. Child are sweet and soft like red roses, they are like tender buds of trees and flowers, lovable and affectionate. We as a parent should guide and teach our ward to be religious, hardworking and to be soft spoken. It is our moral duty to make them walk on the right tract. Precaution should be taken when children are scolded at breakfast time, meal and dinner. They walk away without full stomach and they will have bitterness over their parents and at times reflect on the past, children sometime may feel that my parents does not love me. While eating we must eat like a king without scolding.

We must make them happy before setting out for school like putting up uniform, necktie, soak and shoe etc. We must hundred per cent worth to prove that children know how to respect their teachers and put in full vigour towards acquiring knowledge, they should never compromised with learning videos games and gossiping inside the class. We should see to it that they never feel hungry and fell on the way. After marriage the work entrusted to parents by God is to set the sons and daughters on the right tract. We speak lovingly to them in all circumstance as much as we can so that when we grow old they will take care of us hopefully when we grow old being at the service of daughter—in-law. It is universal law that ageing people are transforming themselves toward nether (Heaven) the old aged peoples are dependence variable. The appearance of ageing people wrinkle everywhere, some of them stoop, absent mindedness and difficulties in moving around for nature cold sometimes, and old aged people use walking stick. The parenting role of daddy and mummy can be broadly look in three phases in an economic environment with connection to children transformation. Self-Esteem: when children put himself economical used of scare resources and respect other using especially renewable and non-renewable resources, flora and fauna should be utilised after thinking properly in order to save global warming and climate change. Then the environmental degradation would be improved by our action. All this environmental programme will take us back to live a gentle life we underwent and gain the respect from others, for instance noise pollution drive slow but some teenage or youngster drive in the city heart with full gear while starting and trying to overtake others. We should try to become an ideal and good citizen. Secondly, Life-sustenance: - All the parent’s should ensure that there is enough shelter, protection, food and green leafy vegetable to make our body healthy and robust (well-build). The children should never remain without food, as of now smart phone, Two wheelers are the need of the contemporary days. Children dropout rate need to be looked into and reduced by imparting good education. Lastly, freedom from servitude and child labour should be done away with it. Since they will become the pillars of our great nation someday they would bear the responsibility and put in their own soldier to bring about a respectable country by other nations. By any mean we cannot become servant despite of problems such as poverty, inequality, Dogmatism (mine is right principle policy) should compromised for the good of all. Summing up ‘Beauty lies in the eye of the beholder’. So the honour, status and dignity of a family lies much on the activity of the parents. The Govt. of India try to go for two child norm and try to give all out security, many reforms were made for girls child in India and women empowerment issues. In India there is marvellous growth in science and technology that is why death rate during child birth is minimum. This tendency make second largest in demography structure of the country. There is a provision in constitution of our country that all children upto 14 years should be given free education incomplete mission in rural India but may be true in cities or town. In connection to free education, Jawahar Nav Vidyalaya is one where all the student are given residential and well train like Train Graduate Teacher(TGT) and PGT(post graduate teacher, B.ed, M.ed are recruited. This JNV impart free education to those poor who are people in the country. A child and teenager should never enter the work force if they are not train and without minimum level such as class ten or twelve. When this minimum degrees are well maintain dropout rate declined and will give good incentive to growth of a nation. If dropout rate are more there will be more crimes, stealing and dacoit. Why? because after getting married having wife and children they are helpless to manage the household they will go to any extreme. These problems can be sorted out with minimum level of education so that a person find job in primary sector, secondary sector and tertiary sector.

The ageingof Humanities, every one of us getting in Jobs market but after a short while when we advance in age and time to get out and remain physical productivity. Yet it is good to live with them for they can lead us in pain and happiness. Let us consider ageing started from 70 yron average. Supposed in a village with 600 households if we can have old age people such as 50 above and Below the villages will remain wars and very cool. Because each of this have a story to told us because their life journal is long. Suppose, prior to Indian Independence. The wage rate for policeman is just RS 40 to Rs 60 as per some elderly reports. This old aged people know the village boundary. When the village face chaos, bloodshed, Village Authority whose number comprise of all that old aged people. They are like egg where the White outer layer protect albumen and York. When somebody retired from service or become old how their contribution toward peace and harmony, progress and prosperity in the economy. They will act as nature advice to turmoil and disturbing area by asking the younger generation never to go for extreme form of agitation and our action that was planned should be based on humanitarian ground and hospitality is the need in our country despite of so many reeling or changing phrases of life in urban and rural. Some people keep grandpa and grandpa into old age home. If we can remain separate it is a sign that our love for them is so little for them. The path of such things will be equally done to us by our children too. When we feed them 10 spoonful of rice and give them good food such as chicken, meat and whatever etc. They will bless their nephew, niece and the father and mother of family. In such activities God will bless in one angle that whoever son and daughter are bless and prayed for them with sincere heart. The Heavenly Father will bless like wise. For instance humankind such as grandpa, Grandma, father, mother, brother, sister, nephew, niece etc. When ageing took place he becomes like child once

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again he would love to eat sweets e.g. such as sweets, meat, helpHim out to go for nature’s cold will be full of wrinkles, bend and need tender care. His bed sheet, quail, blanket and pillow covered etc. should be clean by the daughter in law. The best place for ageing is at home, looking at the nephew and niece playing and support and care given to grandpa and grandma in the long run bring about happiness and God mercy and his blessing comes like shower in the bath tub or at the rainy. Both children and old aged people are dependent, to his son or daughter in law.\textsuperscript{19}The seven status as given by shakespearge are mention below: -Infancy, School goer (boy), teenage, young man, middle age old age and Death.

NITI Aayog launched in 2012 replacing five year plan under the leadership of the then Prime MinistersModiji and his cabinet ministered sitting on their berth. They also throw enough onlooker since it is vital reports on health care and sanitation, the thrust areas: - It focuses on health system for new India, buildingblocks, potential pathways toreform (the way how government will make an investment or spend its public coffer(treasury) for the benefit of all citizen holding the relationship of NITI Aayog). On the day of released of health reports Mr. Vice-Chairman (vice-Chairman of NITI Aayog). Mr. Bill Gates and his wife were present. Policy makers from academia, national and international think tank released the NITI Aayog reports. These programme is so far so good.

Children have a connectivity to ward all aged people, in a colony or ward when problems cope up because of shortage of water and electricity for Instance. In the past people preferred for large family due to backwardness of medical science, tools and equipment’s. And parents are scary that some children may not live long. Now in this 22 century medical science are so developed that all diseases can be treated, all internal parts and organs can be removed and make it like that of original parts. In such state people feel happy to go for 2 child norm. We can referred in context of WilliamShakespeare, seven stages of life.

And from the Robert Malthus, the food production grows at reckoning such as 1, 2, 3, 4…n times whereas the population growth are in geometric progression. Such as $1^1$, $2^2$, $3^3$….$N^n$. Robert Malthus knew very well that even if the goods services are productive, say our GDP (Gross National Income Rises to 9 percent for instance the population of a country crops up and the GDP seem like increasing but not at all. He was little classic as of now after green revolution e.i. food grain in india comes out in such a huge amount that can fed the citizen. The main behind HYV is non-other than k.s. Viswaskanan

The children and old aged people free from doing form hard work like that of shaktiman driver, working in saw mill and working in fire service and water service. They don’t have the strength left to beat back the waves and tides of seas and ocean. Children are dependable variable and so do old age people are another like children. My motive behind abortion is that lets us all find out all value of $x, y$, and $z$. The solution may be $x$ greater than $y$ and $y$ greater than $z$. The best solution for this is, work force are greater than children and together with old age people. Ageing is something that will never pass away from somebody life. Due to Ageing the Vibrant Youth might overestimate the strength of old people. The old ageing people can be a gardener, going around the world, spending their time smoothly in some tourists sport. Child labour is bandh in our country India. Nevertheless the need of the Brahmin, high castes people and Rich people alike. As seen in the times of Moses and Aaron to picked out from the slavery of Egyptian. Children are honest, sincere, and innocent there is no jealousy, there is no hatred and every childhood is a cheerful giver. They bring in and out smile in everyone faces. If the parent can identified the right decision counselling the child in his ability and capability and his preference and liking for example a child was playing a guitar from his friend send the child in that pursuit, but if parent buy cricket bed and cricket ball. The child may not do very well in cricket but he may be given guitar. The bright side of ageing is no climax on driving, taking tea and coffee at times. They are enjoying leisure; each day they are stepping towards their tomb. The economics resources are consumed in a less quantity. It may be flora and fauna, forest resources, water resources, and non-renewable in such life cycle journey ageing are more than products, goods and service. The medical science extend the death rates bring up to 90 year to 120 years of living on average.

‘Because of the development of the ministers’ who are more sincere and transparent in dealing with social welfare bring about changes in the economy. Does not pin uneasy educated flock .when science can fully ensure the life of what can else can we think off because of this logic nuclear highly dependentDue to the growth of Administrative which comprises of Birth and Death records, pensions, tax records, Marriage record etc. the child ratio to workforces should be to the minimum because they are our future pillar and citizen of near future on earth. With the journey for woman in India, their life are affected in north, south, east and West. Women is just a productive machines. Gone are those day of an investment or spend its public coffer(treasury) for the benefit of all citizen holding the relationship of NITI Aayog. On the day of released of health reports Mr. Vice-Chairman (vice-Chairman of NITI Aayog). Mr. Bill Gates and his wife were present. Policy makers from academia, national and international think tank released the NITI Aayog reports. These programme is so far so good.

Survey Data is the primary source of collecting by sending correspondent or the research himself take a friend and go to sample villages from respective villages. Questionnaire contain introduction of sample survey to arouse the feeling of proper respond. I’ve visited eight villages from Tamenglong, Nungba, Taosemand Tamei. My whole survey compare and contrast the role of horticulture and the weight of doing jhum or Wet Cultivation. The commercial crops and horticulture is more provoking and wealth earning activity. After I made statistical

\begin{align*}
C_1 x + C_2 y + C_3 z &= D_1 \\
W_1 x + W_2 y + W_3 z &= D_2 \\
A_1 x + A_2 y + A_3 z &= D_3
\end{align*}

A third order of matrix lies Constant tern along with $x, y, z$ equal $D_1$, $D_2$ and $D_3$. Technically speaking the $LHS = RHS$. It is appropriate to
analysis 95 level of my research objective is full filled. Only 5% is redundant or making an error.As mentioned above Ministry of Health and Familiar Welfare in tune with ministry of agriculture and farmers welfare. This is very vital in present context. Your dinner sets should have minimum three fruits such mango. Graph and Banana. This goods dietary habits at home will makes everyoneHealthy.Ministry of drinking water and sanitation: when we look at the fresh water available for drinking purpose is only 3% and 97% are

Remaining water are unsafe, salty and unfit for drinking. In North East India, Manipur is one such peculiar state having fresh water floating lake with Small Island. And floating island and is destined as tourists spot in and from people around the world. When we examined Ageing in the context of good news, a seed has to get mature and died so that a new sprouted one produce new buds give us a feeling of satisfaction i.e. it gives us back a hundred fold. For Instance a farmer planted a potato one bag, the potato gets decay and the old one is gone and the new shoot (leaf) grows up in the main stem until harvest. we need to work hard and try to keep away from destroying by other animals. Secondly, the creation of 4 lane road i.e. National Highway in our country. The four lane mean Left Hand Side vehicles can moves to and fro. Similarly, Right Hand Side should also made possible two at a time to and fro.Such High the project cost will be heavy the road were destroy that were constructed some decade ago. Everything messing up, road are dusty, during rainy season vehicles are dancing up and down. There are lot of pot hole on the main National Highway.

"Explanation of Harrod model say natural growth rate, actual growth rate and warranted growth. I would argue actual growth rates that makes a steady equilibrium growth in the economy.

Actual Growth Rate: It is denoted by G, this is brought above by saving and capital supply ratios. This two inputs are responsible for cyclical changes in the growth rate.

So, \( G = \frac{Y}{Y} \) and \( Y \) depict change in income and \( y \) is total Income.

Actual growth rate is determined by two factor viz. saving income ratio and Capital output ratios.

\[
GC = S \quad \text{Where} \quad G = \text{actual rate of growth}, \quad Y/Y\text{.........................(1)} \\
C = \text{Capital output Ratios}, \quad K/Y\text{..........................(2)} \\
S = \text{Saving Income Ratios} \quad S/Y\text{.........................(3)}
\]

Substitutes (1), (2) and (3) in the main actual growth rate formula we do have,

\[
\Delta \text{Del Y/y, } K/Y = S/Y, \quad (\text{since } K/y = I/Dy) \quad I/Y = S/Y
\]

Removing denominators of from LHS and RHS, we get final outcome I = S. the direct and indirect application is that bringing up children is one way of saving that investment principal which becomes a nation builder and greater height of economic growth of a nation fall upon the children who grows up and become a part of workforce that pull up static and dynamic equilibrium. Old age people can promotes younger generation in term of formal and non-formal counselling. Every race have their own culture, food and shelter, story of their own to tell, In a vast country like India there is many diversity and mother tongue and tribes, general, scheduled tribes, schedule caste, and other minority. Nevertheless, we have one Prime Minister

And one President and one currency. Let us hope that our grandpa and grandma will bless us for our future forthcoming. Saving is a function of income, investment is a function of income. Therefore, we figure out saving equal investment with respect to income is to be remember. Children population increases then it implies persistent supply of labour remained positive, working population are thinly spread in rural area whereas it is widely spread in cities and town of this present phenomenon(22nd millennium). City are densely populated due to migration of people from rural to urban areas. The reason for migration to city are many it happens because of high wage in urban areas, in contrast only subsistence wage are provided in rural areas. Some went out for getting good education after completion of degrees like Ph.D and searching for Job, having getting the job started to reside in urban areas until retirement or when more persons from same family after getting jobs made a permanent settlement in those state where they got their jobs. In case of ageing (old age) the role of old people toward growth is virtue cycle deal with morality, discipline, respect for others, high standard of living, ethical values and have many dexterity say humbleness, kindness, grace, politeness and mercy with fat income toward others. In contrast cycle of poverty goes in this loop say great grandpa was a farmer and so do young grandpa did the same Job. The productivity of land goes out. So the consequence of soil infertile making then become poor. "In The same manner father is poor and children becoming drop out and no longer in constructive path (education) but fall trap to poverty cycle since food production grows in Arithmetic Progression i.e. 1, 2, 3, 4,........ntimes and population expand by geometric progression i.e. 1, 2, 3,........n(times as per Robert Malthus. To make a country strong for instance Late President APJ Abdul Kalam could have spread his knowledge and wisdom to co-worker and making them substitute to handle(know-how) in the anal of Indian Space Research Organisation (ISRO) for our country. By way of actions and thought for greater height of the country.Centrification of children are drivers of growth when the child grow up and joined workforce in three sector of the economy primary sector, secondary sector and tertiary sector. Finally when children are more it can trained them up and contribute to Gross "National Product GDP or National income. The Gross national product refer to all those goods and services per annum(per year) that is converted in monetary unit plus Indian resident earning in other country and take away money earn by foreigner living in our country. Most preferably ageing need thin demographic profile just because they are no longerproductive. On the other hand children when train them up in a way not to hurt others, and they will do so. In any country workforce together with bulging influx of industry, machine replace human work. The age of information, communication and technology (ITC), we must be able to segregated right information, or fabricated reports, all type of note are putting up in internet this should be verify for our class room discursion. In short it can be said that ageing is something like going down with downstream of a river and shall come no more. But for the children, they mess up and fight up with current of a river that flow down and moves upstream to face any consequence. The collar is obtain when a child is grown up but
this achievement lies on the love and care and must be happy Family. Poverty and unemployment is just an opportunity to go and hunt for real talents God gave for each one of us. The Old aged (ageing) waiting for exit out of this world. But the children is a God gift, we must love both girl child and boy child alike. For instance, if population of a girl child is 600 and boy child is 400 here there is lest conflict. But when male population stood at 700 and girl child is 300, this show the presence of conflict in order to get marriage. In such a situation there is friction and chaos over some beautiful girl. In such a situation, say one girl is being proposed by 6-7 male, if she say yes to all of them. This will give rise to entangle among Youngman’s that might give rose to a class of battle among men.

The girl child should be protected and are equally and treated with equity, like the enjoyment and freedom which are enjoy by the boy child where women’s empowerment is still and unfinished dream. Today work force need dexterity, must know how to handle machinery, tools and equipment and business environment and top extra-ordinary people are our (late) president A.P.J. Abdul KalumAazad., the then p.m. Modiji, Mrs Latamangeskar, Ms NehaKakkar, Mary Com( the Iron lady of Manipur), Ambani brothers , mssharmila Tagore, Ms AashaBosle.

Mr.Reman , P.T. Usha, mr.UditNarayen such people passes their live expedition as in tune with the phenomenon of same sunshine, same rain, same plain and same hill and reached their own destiny. These people are just Rs one from Rs1000. Whatever, talents of one self is mainly subjectivity. You must throw your study (burning mid night oil) sacrifice your best time in reading, forget about your love bird, when you are bore reading too many things and make a strong commitment. Despite of love birds we must not married until and unless our vision are achieved. Whatever it is, “a sound mind in a sound body” to maintained goods health we must live on goods diet mainly green leafy vegetables, reddish, carrot, beans. Pumpkin, mushroom from forest, meat, fish, piggeries, chicken, cow, buffalo, and mithun and along with sea fish and from ocean. The flora and fauna of planet earth is for the consumption of humankind. I am not talking about things that goes inside our body but also with respect to use of tress for construction of house and cement and brick for permanent and good apartment.

The role of children by reviewing Human Resources in India

By the term human resources we are trying to bring in efficiency, educational quality, productivity, organisation ability skill and far sightedness. Children used the scarce resources very carefully when their parents did not make their path so free but pressingahead with greater dream for them. They can be mould in any type of people for instance tyre can be used for tatashaktiman, buses, Scorpio etc. Increase productivity when children are ask to increase the time of hour spent for studying, hard work never goes wasted he comes out with flying colour. Development of Skills, if we are to be typist we need to learn when we were small but after grown-up we not be able to do so. Skills implies multi-facet talents for e.g. worker two wheeler, four wheeler, and body of train (bogies) and aircraft industry. Teenages have been given jobs in most tourists place where good hospitality, making of taste best in whatever items that the foreigner or Indian residing other state.

There are four stages of demographic transition in the theory of population Stage 1: Birth rates are above death rates which pushed economy. At the same time the death rates are more since they are kept away too old aged home where they felt gloomy missing their nephew and niece. Second stages of demography transition are both Birth rates and Death rates are declining due to scientific progress and advancement of the Nation. During second stages death rates is steeper than that of birth. And in the four stages like in first stages the fourth stages shows us that birth rate is higher than death rates, because life has to go through up and down till 25 years to 35yrs. And jobs seeker are widespread across country within and outside India that is scientific reason for marriage. But in the hill many drop out after class seven to class 12, and that lead to early marriage.

<table>
<thead>
<tr>
<th>[1] Four Stages of Demographic transition</th>
</tr>
</thead>
<tbody>
<tr>
<td>[2] Stage 1</td>
</tr>
<tr>
<td>[4] Stage 2</td>
</tr>
<tr>
<td>[5] B.</td>
</tr>
<tr>
<td>[6] Stage 3</td>
</tr>
<tr>
<td>[7] C</td>
</tr>
<tr>
<td>[9] Stage 4</td>
</tr>
<tr>
<td>[10] D</td>
</tr>
</tbody>
</table>
The girl child in the present scenario, Girls are trying to make equal with male whose counter path ‘empower of human being’. The last thing there is softness and humbleness in their heart. Suppose for a petty issue not reading daily mom and dad used to thrust them crying for few minutes the child will get back to the normal mood, play and talk with her mom and dad without any condition which mean unconditional love for parents. Children love for Daddy and mummy is unconditional When Jesus had cross the river many crowd according to “Good News Jairus fallen at his feet and said, “My daughter is at the point of dead “please come and lay your hand so that she would live again. After hearing the news asked him to take him the girl child already before he reached people crying and he told them that the girls are just sleeping in such a place of commotion Jesus and his few disciplines along with the parent brought about big miracles. He spoke out a sentence ‘tale ta Kum’ which means little girl get up and immediately, got up and working around all who witness this remain perplex over the divine work of God. The role of ageing (old people) there was a saying long age and no more in the present days i.e. some book are to be tasted, others to be swallowed and some to be digested these concepts are given to us by Bacon. The role of ageing toward community, statehood and nation as a whole. Ageing is a protocol whereby all humankind will get exit and left our soul for nether world. The world of soul who is worthy enough to God who had created Heaven and Earth. The ageing say pre-ageing can be fitted for the age group say 65 year to 80 year, ageing could be considered as 80 year to 100 year and post ageing have attach with 100 year (one century upto130) We could not overlook pre-ageing people they have strong mind, strong body and their head is full of story to tell their life time experience in whatever form they earn money to run and kept alive the family. For instance from a singer family produce another singer, from a farmer’s family produce more farmer as I have discuss above the virtue cycle as well as vicious cycle of poverty. New pensioned people say Indian army can be recruited back at the times of emergency for they are trained and skill in warfare. And teacher too after retirement can write textbook in whatever specialization they get. If family are not rich Private tuition both for Art and science are reeling and streaming everywhere but we must not compromise and ensure the capacity and ability up to the urge of the students in greater perspective. We may be given the post of chairman ship, we are asked to give exaltation speech in a programme like Republic Day Celebration or an Independence Day celebration, Christmas celebration and New Year etc.

Without the present of elders, old people, the village seems to be void and empty. In any meeting with respect to village like village fund, taxes from those who are opening some store and enterprise in Nungba one and Noney of Manipur and big bazaar(Godi Mall), V2, City skart, and Vishal Mate. Out here in silchar. Old age is still productive and can be reused but post ageing they are childlike in their way of living dependency, when we give them morning meal, he might be gossiping he is not yet getting morning meal. We all enter into this world nothingness and will exit with nothingness. But we can store up our wealth in nether world were no mote destroy our wealth whereas how much wealth we have it would get destroy by mote. Willingness to get into any platform for the good of student wing, youth conference, becoming a brain storming citizen enlightening to go for positive competition and caption not to destroy human being like that of tea glass for a petty issue. It took lot of many year to get white collar job say 30 year to 35 year for tribes living in the periphery of the country. But within minute we can take life and to recreated human being is at the will of God. It is our moral duty to respect an old people alike without caste and creed. All the countries around the world comprises of children, working force, and Ageing. Infantry encourage for they will moves into work force, work force should be skill and very hard working well equipped to handle all modern machinery, tools and equipment. Ageing should be reused, their standard of living must not compromised before retirement and after retirement. They should stay by some saving put up for the old age. Finally they must pray for taking his soul to nether world. Where God the father, God the son and all holy spirit, angels, holy spirit, all queen, all holy people like human was created and in their heart a piece of God ‘heart is encrypt in it. For instance Abraham, Noha and Isaac etc. The son kept and send to the world with some talents or in unpleasant manner. People who crust such positive and negative realm of life are given place in heavenly abode. United Nation International Fund for Children(UNICEF), According to UNICEF, every 66 seconds new born babies dies in India. Therefore, we should ensure all the babies come into this world gladly and their life should be protected the dead rates 66 child’s dying every second would mean we compromise baby death by lack of tools and skillness. If this trend go on parents would not be happy with one child norm. My heavenly Abba Father I thank thee for a real father for me in nether world. The woman from earth whom, Abba father got marry is my real mother. In the good news, it is mentioned that you shall not call anybody father on earth for your father live in
heavenly realm. I thank thee for providing security, protection, forgiving my sins and encourage to work hard since I was class three. If I go to my friend house for Christmas meal or New Year dinner. Old age people gave advice and counselling, that is made for their family. But I took the right counselling and removes the bad one. My Uncle Gold medallist in history, finished Doctorate under one prof. who loves him. Jesus I thank you for giving me a helper since I was a childhood thanking you my father in other world for removing TB, preserved my life from big and small accident, protecting me from JNV Jeep, when I was taking (crossing) mayailambi, I look vehicles coming from left side and from right side dasing at a speed of 40 to 50 speed per km. I also fly out to cruse my two wheeler by bus. Such protection involved the father who live in nether one. There are two kinds of daddy as my personal observation. A dad who love his wife and children in good times and bad times. There are dad who goes wild after wine and simply beating up and spoil the utensil. Another colour of broken family who don’t believes in the existent of God. Wife getting suspicious when dad goes out for office. The husband also get suspicious on wife during office hours. Some husband go on continuous to his wife when wife has no longer impulse. Some wife commit suicide.

AUTORS
First Author – Philip kamei (Asstt. Prof.)

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Not Left Behind: Perspectives from Out-of-School Girls in Northern Nigeria

Kiki James*, Temitope Monyeh*, Hassana Shuaibu*, Samuel Sunday**

* ACE Charity, Abuja, Nigeria
** Technological University of the Shannon: Midlands Midwest

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Abstract- Despite considerable efforts to improve school enrolment among children, school attendance and completion rates in Sub-Saharan Africa remain low. Several barriers have been identified to hinder access to quality education for children in the country, including poverty, religious and cultural factors. ACE Charity, a non-governmental organization, implemented an alternative form of education among out-of-school children in Northern Nigeria, and received significantly positive reception and high participation from beneficiaries. This research was therefore being conducted to provide information on invisible barriers of school enrolment among out-of-school girls in Northern Nigeria and explore the high level of receptiveness to radio as an alternative form of education among girls in Northern Nigeria. A qualitative approach was chosen as the research method for this study, with semi-structured interviews with 100 female participants, purposively sampled, were conducted. Inclusion criteria were female participants who were out of school while ACE Radio School was implemented, and participated in ACE Radio School listening groups, or listened to the radio broadcasts through radio. The study showed that poverty and poor quality of government education were major deterrents to school enrolment in the region, while major motivation for partaking in the alternative education were the learning opportunities, the local language of instruction. The findings highlight that school enrolment will improve if free access to education and high quality of learning is free access to education is provided to girls living in Northern Nigeria.

Index Terms- Alternative education, , Northern Nigeria, Out-of-School Girls, School enrolment.

I. INTRODUCTION

At the expiration of the Millennium Development Goals in 2015, the United Nations member states met in a general assembly to set what is now the 2030 agenda, a set of ambitious goals and targets to leave no one behind, with the promise of ensuring that “all human beings can fulfil their potential in dignity and equality and in a healthy environment” [1]. The Goal 4 of the SDG suggests that there was immediate need to bridge the gap in education, stating that at the end of primary school, children should be able to read and write, as well as understand the basic concepts, in addition to high completion rates in primary and secondary schools without gender disparity. However, the world is now faced with the arduous challenge of meeting the Sustainable Development Goals (SDGs), with the influence of a global pandemic, dwindling economic gains, and insecurity [2]. In 2020, the UN Secretary General report on the SDGs highlighted the negative impact of the COVID-19 pandemic on gains made in achieving the goal for quality education, stating that it has brought about a generational catastrophe [2].

For millions, especially in Sub-Saharan Africa, the pandemic only made the already fragile system even worse. According to the United Nations High Commission on Refugees (UNHCR, 2021) Report on Internally Displaced persons (IDPs) [3], there was a net increase of internal displacement in West and Central African Region to about 1.4 million IDPs owing to continued conflict and violence in the Sahel region, as well as the adverse effect of climate change. In Nigeria, the protracted crises in the North-east of the country have had a major impact on the socio-economic context of the region. Thus, people are faced with increasing economic burden – further plunging families into poverty, unstable political climate, unemployment, and an increased burden of the impact of climate change [4].

Despite considerable efforts to improve school enrolment among children, school attendance and completion rates in Sub-Saharan Africa remain low. According to UNICEF, Nigeria currently has the highest number of out-of-school children in the world, with 10.5 million children estimated to be out-of-school before the pandemic [4]. Several barriers have been identified to hinder access to quality education for children in the country, including poverty, religious and cultural factors [5], however the current narrative in
Northern part of the country states that the insurgency, culture and religion is a major barrier to learning for girls [5]. ACE Radio School, an initiative to bridge the educational gap that existed as schools were shut down during the pandemic, began airing to populations in 8 states in Northwest and Northeast regions, including the Federal Capital Territory. The program aimed to target children in nursery and primary levels of education while also meeting the educational needs of children who had never attended school [6].

When schools resumed in 2021, ACE radio School aired, through radio broadcasts in Adamawa, Kano, Borno and Sokoto states to a new target audience - out-of-school children - during school hours. Additionally, in rural communities in Sokoto, Borno, Kano and Adamawa, out-of-school children were mobilised to form ‘listening groups’ to listen to ACE Radio School episodes, through a speaker. Program implementation data showed positive feedback and high level of receptiveness from the listeners [6], and highlighted the possibility that there may be invisible barriers of learning in these states, regardless of the insurgency. It also highlighted the potential of alternative forms of education in improving access to quality education among out-of-school girls in these states.

This research is therefore being conducted to provide information on invisible barriers of school enrolment among out-of-school girls in Northern Nigeria and explore the high level of receptiveness to radio as an alternative form of education among girls in Northern Nigeria. It is anticipated that evidence from this study will be used to promote school enrollment among girls in Northern Nigeria, as well as provide the basis for the standardisation of alternative forms of educational content delivery to reach the hard-to-reach children and ensure all children receive universal basic education.

II. METHODOLOGY

A qualitative approach was chosen as the research method for this study; this would provide in-depth information and provide opportunity to explore other possible issues. Semi-structured interviews with the participants were conducted. Inclusion criteria were female participants who were out of school while ACE Radio School was implemented, and participated in ACE Radio School listening groups, or listened to the radio broadcasts through radio, and had sent some sort of response asked during broadcasts through SMS. Participants were selected through purposive sampling. In total, 100 girls were selected to participate in the study, Table 1 provides details of the participants, and location.

Data collection took place between September 2021 and December 2021. The Fatima Platform for remote data collection was used to schedule interviews, call participants and record interviews; interviews were stored on a secure server. The length of the interviews varied from participant to participant based on individual differences. Interviews were transcribed by the members of the research team.

All interviews were transcribed verbatim and coded for analysis. Thematic analysis was used to code for and analyze the transcribed content. The codes represent keywords which capture the content in the text; codes were organized and categorized to form themes. Data interpretation was based on the themes that emerged from the codes that were applied, recurring themes were highlighted and similarities and differences in the data were captured. Informed consent was obtained from parents while informed assent was obtained from the adolescent girls. Both parents and participants were provided adequate information on the study and were assured of their willingness to participate in the study or otherwise. All participants were informed of their right to withdraw from the study, as well as their right to not provide answers to questions that they deemed inappropriate. Participants were given advance notice of the interview and objectives of the interview. Signed consent forms were obtained and uploaded on the Fatima Platform and interviews were conducted upon the successful upload of consent forms. Prior to commencement of the virtual interview, another consent was obtained from the participants, through a restatement of rights to participate, confidentiality of interviews and freedom of withdrawal as well as consent to take digital records.

III. WRITE DOWN YOUR STUDIES AND FINDINGS

A. Description of the respondents

Results show that most of the respondents were between the ages of 12 and 17 years. There were 66 respondents from the Northeast (Borno and Adamawa States) and 34 from the Northwest (Kaduna, Sokoto, and Kano) regions. Most of the respondents had dropped out of school, while others had never attended school.

Table 1: Sociodemographic characteristics of respondents

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
</tr>
<tr>
<td>8 - 11 years</td>
<td>9</td>
</tr>
</tbody>
</table>
**B. Exploring Experiences from Out-of-School Girls**

Most of the respondents had never attended school, while those who attended dropped out at some point between primary and secondary schools. Very few stated that they had never attended school, while others dropped out of school at either the primary or secondary level.

<table>
<thead>
<tr>
<th>State</th>
<th>Dropped Out</th>
<th>Never Attended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adamawa</td>
<td>30</td>
<td>5</td>
</tr>
<tr>
<td>Borno</td>
<td>11</td>
<td>20</td>
</tr>
<tr>
<td>Kaduna</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Kano</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Sokoto</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

For most of the respondents interviewed, the lack of school fees or finance was a major challenge to enrolling or completing school.

“*Well, I want to get enrolled, but there is no finance, that’s the case. Honestly there is no money in my household.*” ~ 12-year-old girl, Sokoto

“*Because we need money for school, and we were chased from school, our father does not have money, so I stopped.*” ~ 15-year-old girl, Sokoto Nigeria

Some of the respondents were orphans and had no one able to enrol them in school.

“*It is because I lost my dad, he wasn’t working, and I lost my mother, and she wasn’t working. I just wrote the common (Common Entrance Examination) only, I haven’t entered school.*” ~ 11-year-old girl, Adamawa

There were some respondents who had no support from parents to enroll in school, due to their preconceived beliefs about formal school.

“*Well, the reason is not honorable. Our father didn’t enroll us right from time. When we came back, I said, daddy put me in school, put me in school and he told me I will put you in, until I grew up. When I was growing up, he used to say school corrupts children... there are younger siblings, He didn’t put them, but he is talking about enrolling them.*” ~ 13-year-old girl, Borno, Nigeria

Inadequate educational infrastructure and the lack thereof affects school enrolment, in addition, to lack of teaching staff to instruct students. Most of the respondents pointed out that teachers either do not come to school or are not motivated to teach the students.

“*Because in a formal school, they don’t even teach properly, and children only go to play.*” ~ 12-year-old girl, Sokoto, Nigeria

“*I left school because our teachers don’t come to school to teach us and there is no form of learning going on there. Meanwhile the schools we want, our parents cannot afford them.*” ~ 17-year-old girl, Sokoto, Nigeria

**C. Motivations for ACE Radio School Participation**

Motivations for participating in ACE Radio School were related to perceived benefits and expectations. Respondents were motivated by the opportunity to continue schooling, the fun and engaging learning through ACE Radio school, peers attending, or support from parents or guardians.
“The reason I listen to the radio school is because my younger brother and others were listening and I always sit with them, so I got motivated to listen too and to make use of it for all of us.” ~ 15-year-old girl, Borno, Nigeria (Listening group)

“Well, I went to see our neighbor and heard them listening, so I went home and started listening too. I turned on my father's radio and we started listening to it at home with my younger sister” ~ 14-year-old girl, Borno, Nigeria

“Because I want to become something and what is being taught is very useful for one’s future life, so I kept listening” ~ 12-year-old girl, Borno, Nigeria

The language of instruction, the mother tongue, was also another factor that motivated participation in the radio school.

“...Since the radio school is in Hausa, our mother tongue, you will understand whether or not you go to school. Since if you go to school, you will not be taught in Hausa only, they will include English, some will understand English, and others won’t understand English. With the radio, even if you stay at home, you will understand, honestly” ~ 19-year-old girl, Kano, Nigeria (Listening group)

C. Benefits of ACE Radio School

Respondents expressed how the broadcasts were of benefit to them. Most respondents indicated that learning through ACE Radio School was fun, interesting, and engaging.

“The day I was walking to play, I saw some people being taught, they said we should start attending, they put on the radio, they talk and write, I felt good because I was not in school, and I got things out of it.” ~ 13-year-old girl, Adamawa, Nigeria (Listening group)

“Ever since I started listening to the program, I've always felt like it's brightening my life” ~ 13-year-old, Borno, Nigeria

ACE Radio Broadcasts afforded opportunities for growth, to gain knowledge, and encourage formal school attendance.

“Well, I learnt English. You see, I didn’t know how to write (letters) before, but I can now write to anyone. I enjoyed the radio school and I talk a lot about it and even in this town I think that it has gotten the attention of a lot of people.” ~ 15-year-old girl, Borno, Nigeria (Listening group)

“I found it very useful, especially English language. I learned many things including making sentences, I know how they are written and in science I know many things about it too.” ~ 12 year old girl, Borno, Nigeria

“It was beneficial to me because when I come back, my grandmother, who I’m living with would ask me to tell her, she will be happy, and she would say that it is not in vain that I’m going there, I learn things. because she asked me, and I gave her answers.” ~ 12-year-old girl, Adamawa, Nigeria (Listening group)

“It encouraged me to go to school” ~ 15-year-old girl, Adamawa, Nigeria

D. Differences between ACE Radio School and Conventional schools

Respondents highlighted some differences with formal school learning. Respondents stated differences in commitment, free access, opportunity to engage with the instructor through feedback, and better grasp of concepts.

“We pay fees in formal school and don't pay in the other one. In the radio school, we get free books and we buy in formal school” ~ 17-year-old girl, Adamawa, Nigeria (Listening group)

“We get more attention from the radio school than in our formal schools, most of the time there is a lot of noise in the school and the teachers are not coming and it is hard to understand in formal school” ~ 16-year-old girl, Sokoto, Nigeria

Although the respondents found the method of delivery of content by ACE Radio School engaging and beneficial, some respondents highlighted several features they wished were present in the radio school. This included a wider scope of learning, and more amenities.

“In formal school, we were provided with knowledge, toys, swings and so on, as well as fan and light (electricity).” ~ 13-year-old girl, Adamawa, Nigeria (Listening group)

“Some subjects are not available in radio schools, that are available in primary schools.” ~ 15-year-old girl, Adamawa, Nigeria
E. Parental Support to Participate in ACE Radio School
Respondents stated that they were encouraged to participate in ACE Radio School, as parents or guardians provided radios or handheld devices. They also provided verbal encouragement to the children.

“Honestly my parents got me books and a pen. And whenever it’s time for the program, they sit me down and put on the radio for me to listen and write.” ~ 14-year-old girl, Borno, Nigeria

“...If the radio does not have battery before I get it, she (mother) will give me her phone when it’s time and I return it when I’m done.” ~ 14-year-old girl, Borno, Nigeria

“They supported me by saying when I go, I shouldn’t play considering I’m not in school I have to persevere and learn things from the radio” ~ 13-year-old girl, Adamawa, Nigeria (Listening group).

F. Challenges faced with listening to ACE Radio School
Majority of the respondents reported facing no challenges with listening to ACE Radio School. However, due to societal and cultural expectations, some girls were required to complete chores at home or sell goods for money. Respondents who missed some lessons indicated that they are required to work either at home or in the farm or sell food or non-food items for money.

“Some days I was working and some days I was sent (on errands).” ~ 12-year-old girl, Borno, Nigeria

“Well, sometimes I help our mother work, but I still listen even if I don’t pay attention, I’ll still turn it on, even if I don’t listen to all of it, but at least I got something.” ~ 19-year-old girl, Kano, Nigeria

In addition to work that hinders girls from participating in ACE Radio School, lack of radio was also a challenge that hindered girls from participating.

“When I didn’t have a radio, I go to my neighbours. Sometimes when I go, they say the radio is not on, I usually feel bad when this happens. God helped, I found my father’s spoilt radio and got it fixed and I started listening on my own” ~ 14-year-old girl, Borno, Nigeria

G. Recommendations to Improve Girl Child Education
The need to educate more children to acquire basic education has been seen as a matter of global urgency. The respondents recommended that tuition should be provided to those who are most vulnerable and unable to attend school, while others recommended parental sensitization, commitment from their peers, and teachers.

“We want to go back to school, we would need our school fees to be paid” ~ 12-year-old girl, Adamawa, Nigeria

“They have to commit themselves to school, to reading and learning” ~ 12-year-old girl, Adamawa, Nigeria

“What needs to be done to enable girls attend school is to first talk to parents to allow girls get good education because there is no benefit in hawking” ~ 12-year-old girl, Sokoto, Nigeria

“I want teachers to be more committed in teaching. Honestly that will draw the attention of those who are not interested in school. You see ACE Radio School started and it has encouraged more people to attend school and continuity will make more people interested in learning.” ~ 16-year-old girl, Sokoto, Nigeria

IV. DISCUSSION
This study was conducted following evidence regarding the high level of receptiveness of ACE Radio School in Northeastern and North-western States in Nigeria. ACE Charity was concerned with reaching as many children as possible with educational instruction following the closure of schools during the pandemic. Radio broadcast of instructional content was favoured to ensure that more children can be reached especially children who had no access to school before the pandemic or had dropped out of school for any
number of reasons, in addition, children who were attending ACE Radio School listening groups would be ensured continuity with learning. This study captured participants’ perspectives regarding their experience with ACE Radio School while the results obtained are discussed.

Evidence from the study shows that among the out-of-school girls interviewed, most had dropped out of school, while others reported having never attended school. Lack of finance to pay for school by parents was identified by most respondents as a major factor limiting school attendance, this has been shown to be made worse by prevailing economic or humanitarian conditions in a place which predisposes girls to face disproportionate challenges in the face of crises including but not limited to gender-based violence and child labour, early marriage. A similar study by Alat and Alat in 2011 [7] found that although government schools attracted little to no tuition fees, yet there are direct costs towards learners and households that could be burdensome for poor households. In addition, they also found that girls were required to fulfill duties required of them to complete at home. In the absence of humanitarian crises, negative economic situations could overwhelm parents leading to considering marrying off their daughters as means to secure their futures, resulting in girls being taken out of schools [8]. Another major factor identified in this study to limit school attendance was loss of parents, conflict is one of many factors that could make children orphans. Orphans are vulnerable to several challenges including lack of access to education, gender, and sexual based violence, among others [9]. In addition, some of the respondents indicated not being enrolled in school, due to cultural inclinations and the idea that schooling leads to the corruption of the mind. Finally, poor educational infrastructure was identified as a challenge to attending school, coupled with the lack of qualified teachers in schools.

Following the immediate impact of the COVID-19 pandemic resulting in school closures, the need for innovative ways to bridge the gap created gave birth to ACE Radio School, with children who were already enrolled as well as out-of-school children reached equally. Respondents expressed excitement and delight towards ACE Radio School, having stumbled on programming either through referral or while with peers who were also listening. Respondents stated how participating in ACE Radio School improved their learning, gave them confidence, introduced new concepts they hadn’t learnt before; these resonated with the expectations that respondents had towards ACE Radio School.

ACE Radio School brought learning closer to the girls who now see an opportunity to be empowered and to gain skills. Differences between ACE Radio School and Conventional schools were explored with respondents, many of whom indicated that the radio broadcasts gave them the opportunity to learn, unlike conventional schools where minimal learning took place. Other advantages of the radio school were free access to learning, and the ability to listen to instruction in their native language of Hausa. On the other hand, respondents identified that there was no room for social interaction compared with conventional schools where they have access to toys and other play equipment. They also identified that only a few subjects were available on the radio broadcasts.

Despite the ease of access to instruction through radio, respondents indicated facing challenges accessing broadcasts, one of which is the expectation of girls to meet all necessary work at home before attending as well as responding to errands or hawking, all of which could result in missing broadcasts. It was also identified that some girls go to neighbor’s houses to listen to broadcasts. In a similar study by Barnett and colleagues [9], they identified that some parents did not allow their children to attend listening groups, with higher attendance recorded for boys than girls due to reasons related to increased responsibility for household chores, and safety concerns. On the other hand, however, some respondents reported that they were supported by their parents to listen to broadcasts, by providing writing materials, as well as radio or mobile devices.

The result from the study suggests some implications for implementing educational interventions through remote means:

- Most of the respondents pointed out some difference between radio school and conventional school, noting the absence of social interaction through Radio. Live panel discussion after each broadcast has been recommended to engage with listeners [10].
- Study participants made positive remarks regarding the appropriateness of the instruction language which enables them to understand instruction. Future programming can build on this while also encouraging literacy through practice and other interactive means. In addition, thought should be given to include additional subjects as pointed out by some of the participants.

V. LIMITATIONS

While undertaking this study, the following limitations were encountered which are acknowledged, Purposive techniques were adopted in this study to recruit participants. This was necessary based on willingness to participate in the study and age of respondents. Also, the study used remote data collection methods to collect data from respondents, which required the use of mobile devices from parents or guardians. The possibility of preventing interference by parents or guardians could not be ascertained.
VI. CONCLUSION

This study was conducted to explore the factors that affect school enrolment and retention among out-of-school girls in Northern Nigeria and determining the factors that influenced the acceptance of alternative form of education among them. The findings highlighted that unlike the usual narrative of religion or culture being the major deterrent to education for girls, other factors play a more significant role. These factors are poverty and the low quality of education in public or government schools. Alternatively, the free access to education, high quality of education provided by ACE Radio School proved as facilitators for the acceptance of an alternative form of education among the out-of-school girls.

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AUTHORS

First Author – Kiki James, ACE Charity, kiki@acecharityafrica.org
Second Author – Temitope Monyeh, qualifications, ACE Charity, temi@acecharityafrica.org
Third Author – Hassana Shuaibu, ACE Charity, hassana@acecharityafrica.org
Fourth Author – Samuel Sunday, Technological University of the Shannon: Midlands Midwest

Correspondence Author – Hassana Shuaibu, hassana@acecharityafrica.org, +2348-810892900.
Successful Schools: The Role of Teachers’ Work Innovative Behavior

Widiastuti*, Rosita Endang Kusmaryani**

Widiastuti.2020@student.uny.ac.id*, Rosita_ek@uny.ac.id**
Faculty of Science Education, Yogyakarta State University, Indonesia

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Abstract- The best achievement and success in the education field is the hope for most individuals. Likewise, the educational institution, namely the school, is also trying to realize its success and become a successful school. Realizing a successful school required strategies and roles from every aspect, one of which is the work innovative behavior of teachers. This innovative work behavior is important and becomes one of the factors and indicators of a successful school. The purpose of this study is to describe the role of innovative work behavior in teachers having an important influence in achieving good school. A literature review approach is used in this study by reviewing articles related to the topic of school success which is supported by the innovative work behavior of teachers. The results showed that the role of innovative work behavior in teachers was proven to support school success. Innovative work behavior in teachers is also influenced by several factors and this behavior can also be improved.

Index Terms- successful schools, innovative work behaviour, innovative education

I. Introduction

Entering the beginning of 2020, almost all fields including the education ecosystem are forced to carry out bold learning and face-to-face learning. This is done to minimize the spread of covid 19 and one way so that the teaching and learning process can still be carried out. These changes affect 1.5 billion students or approximately 90% of the population in almost 200 countries (Giovannella et al., 2020). This change in the learning system from face-to-face to online has also changed the view that schools are static institutions, now more flexible and dynamic (Kraft et al., 2020).

Changes in the education system have a positive impact on educational institutions, one of which is increasing teacher competence related to 4C (The Partnership for 21st Century Learning, 2015). Based on the 4C qualifications, teachers are not only responsible for teaching but also become content creators or experts in mastering the material (Indrasari & Takwin, 2019). 4C skills are also one of the reasons why schools need to position themselves to keep up with the dynamic changing times and technological sophistication. Schools learn from companies to improve service quality, innovate, and create a good image (Li et al., 2017). Changes in the school system are very important to deal with the dynamics that occur and become one of the efforts to survive so that the institution can be a well or good school.

The teacher's role in innovation is an important aspect of realizing school success (Shear et al., 2011). Thurlings et al., (2015) the importance of the teacher's role in writing. First, it helps teachers to keep them up to date with dynamic changes in society. Second, facilitating learning and new technologies. Third, to be a starting point for developing citizens as creative and innovative thinkers. This means that teachers must be skilled in the teaching and learning process, develop new ideas, and continue to explore opportunities. This is what educational institutions need today.

Izzati (2018) states that the innovative work behavior of teachers is stagnant because they feel comfortable with conventional learning and choose not to develop and implement innovations in bold learning. Even based on data from the Ministry of Education and Culture among 5.6 million teachers in Indonesia, only about 2% are innovative, and the remaining 98% are not innovative (Khayati & Sarjana, 2015). Therefore, the innovative work behavior of teachers needs to be improved.

Innovative behavior is defined as behavior that creates, introduces, and applies new ideas intentionally in a job, group, or organization to gain an advantage in a job, group, or organization (Janssen, 2000). Innovative work behavior has 3 dimensions, namely generating ideas, appreciating ideas, and realizing ideas (Janssen, 2000). The influencing factors are individual characteristics, demographic differences, motivation, job characteristics, and contextual factors (Hammond et al., 2011).
Innovative work behavior in teachers is important to study because there are still schools that pay less attention to teacher work innovation, not even a few teachers are aware that innovation is important.

The purpose of this article is to describe the role of innovative work behavior in teachers as to what influences realizing school success. The literature examines is the results of research on innovative work factors that have the most important impact on encouraging school success. The results of the study are expected to help administrators, teacher practitioners, principals, and policymakers gain broader insights into how innovative work behaviors can be well supported.

II. Research Methodology

This study uses a qualitative approach with a literature review method or literature review. This method is done by collecting various scientific papers related to the topic of innovative work behavior, especially for teachers. The technique used in data collection begins with collecting references that are relevant to the topic studied, namely school success which is supported by the role of innovative work behavior in teachers. The next step is to conduct a literature review that supports the discussion on this topic and the last is to present the results of the literature study in descriptive form.

Researchers searched for research results published in reputable national and international journals, using keywords including innovative work behavior, innovative teachers, good schools, good schools, innovative education, and innovative work behavior for teachers. From this technique, the researcher analyzes the content of the research results in the literature found, chooses the one that contains the most convincing explanation for the researcher (based on empirical evidence, actual, scientific examples, and many citations), and synthesizes/combines the research results before finally drawing conclusions concluding.

III. Result and Discussion

The role of innovative work behavior in teachers who have an important role in determining school success can be described in 2 topics of discussion, namely (1) indicators of successful schools and (2) factors that influence teacher innovative work behavior.

School Success Indicators. The predicate of successful schools in most countries is given to schools that have good academic performance resulting in high academic test scores in students (Beuermann et al., 2018). The perspective of other experts states that a successful school is a school that does not only look at the results of academic examinations but also schools that provide students with various skills needed to be more productive in the labor market and able to contribute positively to society (Hay & Hodgkinson, 2006; Postman, 2011).

Successful schools by (Newmann & Wehlage, 1995; Weisman, 2000) are defined as educational institutions that use restructuring tools to help them function as professional communities. That is, they have methods to channel teacher and student efforts toward clear goals, and they create opportunities for teachers to collaborate and help each other achieve goals. The restructuring tool in question is an innovation, which can be used as a means of improving high-quality quality. In quality schools, it is also generally found that principals and teachers increase their resources by strengthening the supportive climate and making continuous innovations in curriculum, teaching, and assessment (Newmann & Wehlage, 1995). A successful school also means that schools can have a positive impact on their students according to the characteristics and potential of each child (Beuermann et al., 2018; Hudson, 2009).

One of the characteristics of school success is the behavior of teachers. (Hudson, 2009) states that a good teacher is a good school, meaning that the teacher's role is the key to school success. (Lipsitz & West, 2006) divide three criteria for school success, namely academic excellence, dynamic/adjusting circumstances, and fairness. Academic excellence includes curriculum, teaching, and assessment aligned to high standards, and all students are expected to meet or exceed those standards; schools provide opportunities for teachers and other teaching staff to plan, select, and engage in professional development that is in line with recognized national standards. Dynamic criteria in dealing with situations, namely schools provide access to comprehensive services that foster healthy physical, social, emotional, and intellectual development; schools support and facilitate students in improving welfare. Fair criteria include all students including equal access to services, each group has the authority and responsibility in advancing the school. (Sengottuvel & Aktharsha, 2015) state that one of the benchmarks for the success of a school is the effectiveness of teachers in carrying out institutional tasks required by their office functions.

There are 9 characteristics of successful schools according to (Leithwood & Azah, 2017), namely: (1) The vision, mission, and goals of the school are clear and widely disseminated. (2) Have a coherent guidance and mentoring system. (3) Use a variety of sources intentionally and consistently and inform clear decisions. (4) Learning-oriented organizational improvement process. (5) Professional competence development in all school components. (6) Budget, structure, personnel policies and procedures, and use of time are aligned with the mission, vision, and objectives. (7) Having professional leadership: a comprehensive approach to leadership development. (8) Leadership elected by the supervisory board. (9) Have a harmonious relationship with all elements of the school.

Factors Influencing Work Innovative Behavior. The concept of innovative work behavior was introduced by (Scott & Bruce, 1994). This concept continues to evolve and more and more other researchers are interested in a broader range of innovative work behaviors. (de Spiegelaere et al., 2014) defines innovative work behavior as referring to all employee behaviors related to finding, developing, proposing, and implementing innovative ideas within the organization in improving innovative performance. Another definition is behavior that creates, introduces, and applies new ideas intentionally in a job, group, or
organization to gain an advantage in the performance of a job, group, or organization (Janssen, 2000). Innovative work behavior is a deliberate behavior (Bos-Nehles et al., 2017; Janssen, 2000).

Innovative work behavior is also in the field of education, namely behavior that involves changing and improving the learning environment for student progress such as the application of methods, tools, technology, and useful content for students and increasing creative potential (Baharuddin et al., 2019). Research conducted by (Indrasari & Takwin, 2019) mentions innovative work behavior in teachers called TIB or teacher innovative behavior which is defined as the sum of all physical and cognitive work activities carried out by teachers in the context of work, either individually or in work teams, which includes tasks that require innovation tasks consisting of opportunity exploration, idea generation, idea promotion, idea realization, and reflection. There are three main reasons why teachers need to adopt innovative behavior. First, work innovation is very important to deal with rapidly changing behavior. Second, new and forthcoming advances in teaching about work are innovative because teachers and their teaching styles in particular have the greatest impact on student outcomes on learning and motivation. Third, to become a milestone in innovative behavior, which is expected to trigger competition in the wider community (Awang-Hashim et al., 2017; Klaeijsen et al., 2018). Therefore, innovative teacher behavior will have a positive impact on schools.

Janssen (2000) that this innovative work behavior consists of three stages, which are called dimensions. The first is generating ideas (Idea Generation). Ideas involve paying attention to developments and changes within a person in the workplace and the wider organizational environment to identify problems and needs for innovation or opportunities. In this dimension, teachers and school institutions must pay more attention to changes in the environment. As it is today, the change in the learning process to being brave must be explored more to find opportunities and solve existing problems. The second dimension is the idea, the innovator looks for supporters to legitimize the innovation and promote the realization of the idea. This task involves the process of obtaining support and supervisory support in this case the principal, keeping up-to-date on current processes, with superiors on approvals and resources, and disseminating ideas among other teacher co-workers. The third dimension is the realization of ideas. At this stage, the existing ideas must be implemented and are expected to be widely influential. Not only until implementation but there are subsequent actions such as evaluation and improvement so that the idea is getting better and better.

**Antecedents of Innovative Work Behavior.** Hammond et al., (2011) state that 4 factors can influence work innovative behavior. Four factors include individual characteristics, demographic differences, motivation, job, characteristics, and contextual factors. The intended individual characteristics are their potential to be innovative based on the psychological capital they have. Hammond et al also explain related to the Big Five concept, where openness is very influential on a person's attitude to innovation. The second factor is demographic differences, length of work, and education. The longer the individual works, the more and more varied the experience he has, and the higher a person's education, the higher the ability to innovate. Work experience also affects the competencies possessed by teachers (Indrasari & Takwin, 2019). So these two things are said to be one of the factors that influence work innovative behavior.

The third factor is motivation. Motivation consists of intrinsic motivation and extrinsic motivation. Intrinsic motivation is said to have more influence on innovation, this is because the basic drive comes from within oneself. While extrinsic motivation can come from salary and benefits. The fourth factor is job characteristics which include job complexity, autonomy, time pressure, and roles. The more dynamic a job is, the more challenging it is for individuals to make changes. The fifth factor is contextual which includes organizational climate (eg, participatory, open, and safe climate), availability of resources, supervisory support, LMX, and transformational leadership. Why transformational leadership? This is because the transformational leader responds to the need to make changes in the organization, and responds to signals of new trends because he understands the potential direction of change. The transformational leadership style tends to make changes so that the organization it runs is competitive and achieves better (Sokol et al., 2015).

Hammond et al (2011) and Thurlings et al (2015) support Bandura's (1997) theory that behavior has a reciprocal relationship that influences one another in the context of the individual and the environment. So on the innovative behavior of the teacher's work, he sees the relationship between 3 elements, namely behavior, the individual, and the environment. Teacher behavior is assumed to have a dynamic and contextual relationship with individual elements and the environment. Therefore, based on the explanation above, the factors that influence work innovative behavior between one factor and are interconnected.

Teachers are encouraged to be able to innovate, and face problems so that they can run effectively and efficiently so that the quality of education can still increase (Supriadi, 2018). According to data from the Ministry of Education and Culture, there are only 2% of teachers in Indonesia are innovative while the rest, or 98% are declared less innovative (Khayati & Sarjana, 2015). In addition, in some areas, there is still a low level of innovative behavior in teacher work. In Bekasi Regency, the low behavior of teachers in innovating is caused by the inability of teachers to deal with curriculum changes, mastery of technology, and low motivation to innovate (Khayati & Sarjana, 2015). Another problem of innovative work behavior is that almost 75% of teachers in DKI Jakarta do not prepare for learning well and tend to teach using a monotonous method so that they are less creative and innovative to arouse students' learning motivation (Leonard, 2016).

On the other hand, the innovative work behavior of teachers has been going well. The teachers at SMP 7 Ciamis implemented innovative work behaviors, and they were successfully developed and accepted by students to be more enthusiastic during lessons (Supriyadi et al., 2020). UNICEF also runs a program related to innovation in the field of education. This program is known as Creating Learning Communities for Children (CLCC). CLCC focuses on education and gender equality in 78 districts of 15 provinces in Indonesia (UNICEF, 2010). The existence of the CLCC program helps schools...
manage their resources and is one of the school management strategies that currently requires every school to create its curriculum, and this is why the role of teachers in innovation is important.

### Table 1. Factors of IWB

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<thead>
<tr>
<th>Factors of Innovative Work Behaviour</th>
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<td>Demograph</td>
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<tr>
<td>Gender, education, tenure, income</td>
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<tr>
<td>Personality Characteristics</td>
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<tr>
<td>Big Five theory, personality, traits, competencies</td>
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<tr>
<td>Motivation</td>
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<td>Intrinsic, extrinsic</td>
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<td>Job Characteristics</td>
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<td>Autonomy, job control</td>
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<td>Contextual</td>
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<td>Organizational climate, leadership style, leader member exchange, government policy</td>
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These factors should be developed and managed properly to promote innovative behavior that can help achieve school success. The picture of the success of schools in Indonesia that are successful in innovating is not small. The difficulty of students in rural (Ambon) learning mathematics triggers teachers and schools to apply new learning methods. They apply a concept called Math GASING, which emphasizes how to learn to count easily, is fun, and is meaningful, and does not focus on mathematical formulas. The result of this easy multiplication concept is proven to increase students' interest and motivation in learning mathematics, as evidenced by the increase in problem-solving skills in multiplication. Finally, students can do mental arithmetic for anything given a multiplication problem and answer many multiplication questions very quickly and precisely (Hendriana et al., 2019).

Research conducted by Darwin et al. (2019) on 427,189 teachers from all levels of education in 34 provinces in Indonesia related to the development of innovative teacher professional development (TPD), innovative than male teachers. This also supports the opinion of Mast (2020). The development of increasingly sophisticated technology is also utilized by teachers. Schools have also given many policies that material is obtained not only from books but from sources on the internet. Therefore, currently, many teachers are using the sophistication of technology and social media, especially Facebook for learning. Teachers and students also use Facebook to learn to communicate using English. This method is effective in improving the ability of teachers and students, because Facebook as a language teaching medium encourages a collaborative environment, builds positive attitudes, increases student motivation and participation, and maintains teacher-student relationships (Inderawati, 2017).

The picture of the innovative work behavior of teachers that has an impact on the success of schools in Indonesia does not appear to be evenly distributed. Therefore, efforts are needed that can encourage the innovative behavior of teachers in Indonesia. Several studies have shown that one of the effective efforts to improve teachers' innovative behavior lies in leadership including their leadership style (Hidayat et al., 2020; Purwanto et al., 2021; Supriyadi et al., 2020). Leaders can help improve, establish, and maintain a desirable organizational culture that can influence innovative work behavior by generating new sets of shared values that can generate and address organizational cultures that promote innovation, and can shape organizational cultures that foster innovation (Khan et al., 2020). Therefore, the role of leaders is important in motivating and encouraging teachers to innovate to create a dynamic, competitive, and superior climate.

### IV. Conclusion

Innovation is the key to change and existing problems. Another perspective says that with innovation, even complex situations can be answered. In the education sector, especially schools, in achieving success, one of the important indicators also states that the role of the teacher's innovative behavior is the foundation. Principals also play an important role in encouraging and motivating teachers to behave innovatively. Therefore, establishing a positive work climate and facilitating teachers to develop their competencies can create the desired changes. That way, the vision and goals to become a successful school can be realized.

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**Author**

**First Author** – Widiastuti, Psychology, Yogyakarta State University, Indonesia;  
**Second Author** – Dr. Rosita Endang Kusmaryani, M. Si, Psychology, Yogyakarta State University, Indonesia;  
**Correspondence Author** – Widiastuti, Psychology, Yogyakarta State University, Indonesia; widiastuti.2020@student.uny.ac.id, +6285712867709
Implementation of the Electricity Load Monitoring Trainer and Internet of Things-based Power Factor Improvement

Irgi Surya*, Jaja Kustija*

* Department of Electrical Engineering Education, Faculty of Technology and Vocational Education, Indonesian University of Education, Bandung, Indonesia

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Abstract - Electrical problems that often occur, such as in industry, one of which is caused by the low working power factor so that the electric current becomes high and reactive power (VAR) must be paid and charged to consumers, this is certainly a problem and losses to PLN consumers have been widely discussed but in the reality is that the power factor is still low and not ideal. This research aims to design, create, control, and evaluate a trainer that can improve power factor on electrical loads and can monitor it in real time and can even be controlled remotely using the internet. The method used is through the Analysis, Design, Development, Implementation, Evaluation (ADDIE) approach. The results show that this trainer is feasible to use because based on experiments this trainer is able to work well and provide convenience for users and can monitor in real time current, voltage, energy, frequency, power factor, real power, apparent power, and reactive power both only using smartphones, laptops, tablets, or computers. It is hoped that in the future this research will be able to continue to be developed so that the use of electrical energy in industry can be much more effective and efficient.

Index Terms - Trainer, Power Factor Improvement, Monitoring, ESP32, PZEM004t, Adafruit.IO.

I. INTRODUCTION

In this research a real-time IoT-based power factor monitoring and power factor improvement trainer was designed to improve electrical energy efficiency so that the use of electrical energy can be optimized and high reactive power (VAR) payment losses from low power factors can be avoided[1][2]. The advantages of this trainer include being able to improve the power factor automatically because it is based on IoT[3] this system can be interconnected with digital devices that support the internet such as smartphones, laptops, tablets, or PC computers so that usage is more flexible because it can be monitored from anywhere and anytime as long as it is connected with internet access[4]. Users are not limited, meaning that as long as users have access to the server using a username and password, they can access multiple people at once (multiuser) to monitor electrical loads and improve power factor[5]. It's not difficult to use because users only need to wire and connect the trainer to the electrical load to be tested, then just log in to the Adafruit server[6].

This research aims to design, create, control, and evaluate a trainer that can automatically improve power factor on electrical loads and can monitor it in real time and can even be controlled remotely using the internet[7]. The method used is through the Analysis, Design, Development, Implementation, Evaluation (ADDIE) approach, namely by studying the literature to analyze the research object, then designing and developing the design results and implementing the design results and then implementing it on the research object[8][9][10], improvement of this system, the novelty of this research is to help users monitor electrical loads in real time and make power factor improvements automatically and without the need to use applications or software that must be downloaded first[11], users only need to enter the AdaFruit website, this is certainly far easier and more flexible in its use, unlike in previous studies that have been carried out the user must first download a software or application and this system is also equipped with the use of sensors so that this system can work more efficiently[12].

The term "internet of things" refers to the idea in which items or objects are embedded with software and sensors for the purpose of interacting, connecting and sharing data with other devices as long as those devices are connected to the internet[13]. The idea behind the Internet of Things is that anything can transmit data over a network without requiring human-to-human or human-to-computer communication[14]. The degree of convergence of wireless technologies, microelectromechanical systems (MEMS), the internet, and
QR (Quick Response) Codes provides insight into the growth of the Internet of Things. RFID (Radio Frequency Identification) is another communication technique that is often associated with the Internet for everything. Along with its development, the internet of things has modernized many electronic equipment by changing systems that still use traditional programming into systems that can be controlled, monitored, or monitored remotely[15].

NodeMCU is an open source IoT platform. Consists of hardware in the form of an on-chip ESP32 system made by Espressif System. NodeMCU can be analogous to an Arduino board connected to the ESP32[16]. The ESP32 microcontroller is made by a company called Espressif Systems[17]. One of the advantages possessed by the ESP32 is that it already has Wi-Fi and Bluetooth in it, so it will be very easy when we learn to create an IoT system that requires a wireless connection[18]. The ESP32 microcontroller has the advantage of a low-cost, low-power system with a WiFi module that is integrated with the microcontroller chip and has dual-mode bluetooth and power-saving features making it more flexible[19].

Adafruit IO is an MQTT server service provider for the Internet of Things, this service can be used to make ESP32 NodeMCUs can be controlled remotely by using subscribe and publish facilities[20]. Without the need to use other applications or software, users only need to access the available websites, the advantage of Adafruit IO is that users are not charged when creating an account and using it as a server that will be connected to the NodeMCU ESP32[21].

A. Literature Review

![Power Triangle Diagram](https://via.placeholder.com/150)

**Figure 1 a). power triangle before repair b). power triangle after repair**

- \( S = V . I \)  
- \( P = V . I \cdot \cos \varphi \)  
- \( Q = V . I \cdot \sin \varphi \)  

\( S \) = Apparent Power  
\( P \) = Active Power  
\( Q \) = Reactive Power

The effect of changing cos is getting closer to 1;  
- \( S \) getting down  
- \( I \) getting down

\[ Q_c = Q - Q' \]  
\[ = P \tan \varphi - P \tan \varphi' \]  
\[ = P (\varphi - \varphi') \]

Based on the Figure 1, Power factor or work factor is the ratio between active power (watts) and apparent power/total power (VA), or the cosine of the angle between active power and apparent power/total power (see power factor improvement figure). High reactive power will increase the angle and consequently the power factor will be lower[22]. A good power factor ranges from 0.85 to near perfect or one. In theory, if all the power loads supplied by the state electricity company (PLN) have a power factor of one, then the maximum power transferred is equivalent to the capacity of the distribution system[23]. Thus, with an induced load if the power factor ranges from 0.2 to 0.5[12][22][24] then the capacity of the electricity distribution network becomes depressed and the current will be higher as a
result PLN equipment will become ineffective because this high current is a loss for PLN so that PLN will charge reactive power costs (VAR) for companies or industries that have a power factor below 0.85, which is required by PLN[25]. So the reactive power (VAR) should be as low as possible for the same kW output in order to minimize the total power requirement (VA) and lower the electric current[26]. The power factor or work factor describes the phase angle between the active power and apparent power. Low power factor is detrimental because it results in high load currents[27]. This power factor improvement uses KVAR capacitors[28]. Capacitors to improve power factor can be done by paralleling KVAR capacitors to improve power factor on electrical loads in factories or industries[29].

B. Power Factor Improvement Concept

Based on the Figure 2, it can be seen that a power source with mixed loads is generally in the inductive load industry, the dominant inductive load will result in a low power factor of the installation system used[30], this of course results in high electric currents that work as well as safety equipment and electrical components used, becomes ineffective, this is certainly a problem that needs to be solved[31], the solution to this problem is to install a KVAR power factor improvement capacitor in parallel with the electrical load as shown in the figure, then by installing it in parallel the power factor will increase and result in a decrease in electric current due to a good power factor or more than 0.85[32].

C. Example of Calculation Case for Power Factor Improvement

Figure 3 example of calculating the condition of the closed switch S

- \( Z_1 = R + jX_L = 60 + j80 = 100 < 53.13^\circ \)  
- \( Z_2 = -jX_C = -j125 = 125 < -90^\circ \)  
- \( Z_{total} = \frac{Z_1}{Z_2} = \frac{Z_1 Z_2}{Z_1 + Z_2} = \frac{(60+j80)(-j125)}{(60+j80)+(-j125)} \)  
- \( Z_{total} = \frac{-j7500-(-10000)}{10000-j7500} = \frac{12500<-36.87^\circ}{75<-36.87^\circ} \)  
- \( Z_{total} = 166.67\Omega \)
\[ I_{\text{eff}} = \frac{V_{\text{eff}}}{Z_{\text{total}}} = \frac{100^{0} < 0^{0}}{166.6^{0} < 0^{0}} = 0.6 < 0^{0} \text{ Ampere} \]  
(12)

\[ P = V I \cos \alpha = \text{Re}[V_{\text{eff}} I_{\text{eff}}^*] = \text{Re}[(100 < 0^{0})(0.6 < 0^{0})] \]  
(13)

\[ P = 100 \cdot 0.6 \cos(0^{0}) = 60 \cos 50^{0} = 60 \cdot 1 = 60 \text{ watt} \]  
(14)

\[ Q = V I \sin \alpha = 100 \cdot 0.6 \sin(0^{0}) = 60 \sin 0^{0} = 60 \cdot 0 = 0 \]  
(15)

\[ S = V_{\text{eff}} I_{\text{eff}} = (100)(0.6) = 60 \text{ VA} \]  
(16)

\[ \text{power factor} = \varphi = \frac{P}{S} = \frac{60 \text{ watt}}{60 \text{ VA}} = 1 \text{ and } \varphi = \cos^{-1}(1) = 0^{0} \]  
(17)

II. METHODS

The research method used in this research is using the ADDIE method (Analysis, Design, Development, Implementation, and Evaluation) using this research method is expected to produce industrial products and can also be used to produce learning media. In this study, the learning product made was a trainer monitoring power factor improvement. These learning products are used as learning media in electrical circuits and IoT courses. The research procedure in this study can be seen in Figure 4.

![Figure 4 research method block diagram](image-url)

Based on Figure 4, the research procedures and stages are explained, at the analysis stage the researcher conducted a literature study by observing and collecting information and analyzing the needs of learning media in electrical circuits and IoT courses. At the design stage, the researcher designs learning media products according to the needs of the results obtained from the analysis in the first stage. At the development stage, the researcher compares the learning products that have been made with the planning in the previous stage, then the trainer monitoring the power factor improvement is tested functionally, and the instrument is tested for validity. The implementation phase consists of two stages, namely functional testing and limited testing and seeing the response of the Adafruit dashboard whether it is connected properly or not. Limited tests to determine the extent to which the reliability, effectiveness and accuracy of the trainer's measurement results are carried out so that when the tool is used the specifications of this tool are known. Finally, an evaluation and analysis of the performance of the tools and systems that have been made is carried out to obtain the level of feasibility.
III. RESULTS AND DISCUSSION

A. Trainer Architecture

Based on the Figure 5 it can be seen that the architecture of this system consists of 3 main parts, namely, users, internet servers, as well as trainers and electronic equipment loads. Users can use smartphones, laptops, tablets, or PC computers to monitor electrical loads and make power factor improvements and control them directly and in real time just by logging in to the Adafruit IO mqtt server which can be accessed via the website without the need to download an application first. The internet and servers are liaisons through the internet network between users and electronic devices which will later be monitored and controlled remotely as well as multiuser.

The function of each part of the architecture:

a) Internet in this case is a liaison between users and trainers

b) The NodeMCU ESP32 used in this trainer works as an interface liaison via wifi to the Adafruit.IO mqtt dashboard

c) Mqtt Adafruit.IO is a dashboard that functions to display the results of measurements as well as a controller via pushbutton available on Adafruit.IO

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B. Flowchart of Trainer Usage

Based on the Figure 6 it shows the flow of using the trainer which includes registration and creating an account if you don't have an account to be able to login to the adafruit dashboard, after having access to the adafruit dashboard, the next step is to prepare the trainer and do the wiring first according to the circuit drawing, connecting trainer with an input supply voltage of AC 220 - 240 volts then turn on the trainer by activating the power switch on the trainer, the next step is if you don't have a program to run the trainer, you can make a coding program on the Arduino IDE first, the program can also continue to be developed by adding functions or components that are deemed necessary (continues improvement), if the trainer does not work as planned, it can be checked again on the Arduino IDE coding program or check the wiring.

Figure 7 flowchart of trainer usage
C. Functional Tests and Limited Trials

Figure 8 electric load monitoring trainer and power factor improvement
Figure 9 graphical display of results from functional test measurements and limited trials

Based on the Figure 9 it can be seen that the graph shows that there is a decrease in current by 0.4 A from the previous 0.54 to 0.14, there is also a decrease in apparent power from 40 VA to 32 VA but there is an increase in the power factor from the previously not installed repair capacitor. The KVAR power factor is 0.5 and after the capacitor is installed the KVAR power factor improvement becomes 0.61. This is certainly in accordance with the concept of improving the power factor.

IV. CONCLUSION

Based on the results of the research, it can be concluded that the electric load monitoring trainer and power factor improvement function well, can take measurements in real time on the electrical load, can monitor and control it remotely as long as it is connected to the internet. The results of the limited trial also show that the measurement results displayed through the Adafruit dashboard are in accordance with the concept of power factor improvement, the results before and after the installation of KVAR power factor improvement capacitors show an increase in power factor of 0.11 in a limited trial using an inductive load with a power of 20 Watt. This trainer has a lot of room for future research and development. This trainer is expected to be able to solve problems related to energy regulation and saving electrical energy. Although in this project there are still many shortcomings that must be investigated in the future.

V. DISCLOSURE OF CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Thank you to all those who have been directly involved in this research, thank you to parents, younger siblings, and all the family who always give encouragement and uninterrupted prayers, thank you to the STE supervisors who always provide direction, input, and knowledge in this research. Last but not least, i wanna thank me, i wanna thank me for believing in me, i wanna thank me for doing all this hard work, i wanna thank me for having no days off, i wanna thank me for, for never quitting.

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AUTHORS

First Author – Irgi Surya, a student who is pursuing a bachelor's degree in an electrical engineering education study program, research interests include the internet of things, artificial intelligence, Department of Electrical Engineering Education, Faculty of Technology and Vocational Education, Indonesian University of Education, Bandung, Indonesia. irgi.surya@upi.edu

Second Author – Jaja Kustija, a lecturer at the Indonesian Education University, research interests include the internet of things, artificial intelligence, remote laboratory, technology and vocational education, Department of Electrical Engineering Education, Faculty of Technology and Vocational Education, Indonesian University of Education, Bandung, Indonesia. jaja.kustija@upi.edu

Correspondence Author – Irgi Surya, irgi.surya@upi.edu 085759023579.
Factors affecting the choice of Home Economics course by male students in the Northern Province of Sierra Leone.

Fatmata Helen Kabia

Department of Culinary Services and Domestic Arts
Makeni Campus, Ernest Bai Koroma University of Science and Technology

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Abstract- This survey study attempts to investigate the factors affecting the choice of Home Economics course by male students in the Northern Province of Sierra Leone. The purpose of the study was to find out student, government, teaching, institutional and society factors influence male learners’ choice of the subject. The targeted population for this study was students of the Ernest Bai Koroma University of Science and Technology from teacher certificate, higher teacher certificate and first degree levels. The structured questionnaire was the main data collection instrument where 120 was administered only 100 received filled which form 83.33% response rate. The collected data was analysed by applying the simple percentage score method for each item under each factor were used. It was found that the male students’ choice of Home Economics as a course is influenced by society, student, institutional, teaching and government factors. It is recommended that; the government of Sierra Leone to build more technical and vocational centres in the Northern province that cater for even the non-formal sector; Provide adequate funds or grant to support these institutions so that it can enhance their capacity to accommodated more students;

Index Terms- Home Economics, teaching, learning, participants, factors and career

I. INTRODUCTION

Home Economics is an elective course comprised of three subjects, food and nutrition, clothing and textiles and management in living. Students of Home Economics have the option of specializing in either food and nutrition or clothing and textiles. When it comes to Home Economics as an academic course of study, gender is visible in Sierra Leone and plays a determinative role in students’ participation. In all the male dominated schools in the Northern part of Sierra Leone, Home Economics is not taught there and at the same time technical subjects are not taught in girl schools. Few co-educational schools have introduced both courses but males students normally don’t enroll into Home Economics as few girls enroll into technical courses. The aim of introducing Home Economics in Sierra Leone educational institutions was to equip students with the knowledge and skills necessary to lead effective lives in different roles and contexts in society. In Sierra Leone today, the society is still having the stereotype perception as there are jobs for males and females. These differential roles for boys and girls pose a very serious problem to Home Economics as a course of study for male because a lot of people see it as a course meant for females. Despite being thought of as female oriented discipline was never intended to be for women only. Home Economics is on the other hand perceived by many people in society as a course purely designed for domestic affairs, hence a course for girls. The society both educated and uneducated look down on any male learner studying Home Economics (Nnuba 2013). It is apparent that there is a gender gap in Home Economics. Male learners are significantly more likely to choose Science, Agriculture, Business or technical studies. (World Bank 2012). One of the components of technology and livelihood education in secondary level is Home Economics. This is being taught since most people are likely to have and will build families of their own.

II. LITERATURE REVIEW

a) The influence of parents on learner’s choice of Home Economics

The influence of parents in the development of learners’ interest in vocational/technical subjects cannot be over-emphasized because parents seem to have much influence on children’s choice of educational career (Davies et.al.2006). Parents use double the amount of discouraging comments towards daughters than they do to sons when it comes to the subjects that take. This enforces the stereotypes that already exist about gender differences leading females to feel less confident in certain subjects and opting to take other subjects (Tenenbaum 2009). The socio-economic status of the parents of a child has the likelihood to determine the type of career one chooses to follow. Some parents have biased and rigid thoughts regarding the occupational choices of a child/children. As a result, it is usually common for learners from poor background to choose Home economics as a subject (Nnuba 2013)
b) Teachers’ perception towards male learners choosing Home Economics

Teachers believe that family living should be taught in the home rather than at school, and they recognized that the organization of a co-educational class would need to be different from girls’ class. In addition to this, boys are more likely to be influenced by their male group members who might devalue schoolwork and so put them at odds with their academic achievements. This shows that female teachers are expecting to have female learners in their Home Economics classes. That is why they do not allow learners to choose subjects themselves but help them to do so (Egun, 2008).

c) Male learners’ perception toward Home Economics

The subjects choices open to a learner depend on the average popularity of subjects in the school and this varies with the social mix of learners. The gender of learners can often affect their enrolment in a class (Davies et al. 2006) indicated that boys and girls have different values and there are certain standards or expectations that vary between genders. This means that some schools offer varieties of elective subjects and the common norm is that learners tend to choose the subjects mostly enrolled for in the school. Generally, a negative attitude towards a given subject leads to a lack of learners’ interest in the subject and when subjects are to be selected, as secondary school learners commonly avoid the subject or course. According to Abell (2006) stated that the quality of a subject means that laboratories for this subjects are well equipped and the subject is taught by qualified teachers.

d) Cultural and traditional norms and beliefs preventing male learners in selecting Home Economics

Sex-stereotyped occupation of girls over boys is a tradition which has socialized males into believing that it is ridicule of manliness to venture into an occupation that is female reserved (Egun 2008). According to Seze (2001) found the factor that influence male learners in the field of Home Economics to be differential socialization patterns of boys and girls at early stages of life. Male learners who choose to socialize with female learners at an early age are considered to be homosexuals. Male learners who choose Home Economics are viewed as different from the culturally directed belief of maleness. In the past, girls were expected to make marriage and motherhood their main concern while boys were expected to go on to work and support the family (Dike 2006). Therefore, the school life reflected these expectations as girls now have greater confidence in their abilities (World Bank, 2012). Feminism has influenced cultural attitude change but also changes in education. Policies that promote equal opportunities in education and care have reduced bias in gender expectations. Boys and girls may choose different subjects because of early because of early socialization.

e) Strategies to change the perceptions and increase enrolment of male learners in Home Economics

According to Tenenbaum (2009) lamented that the school has a great role to play in influencing learners’ choice of subjects and so it should support subjects and career decision making. This will go a long way to encourage learners’ choices of subjects. In addition, learners need information about the structure and content of the subjects they want to study. Poor orientation is the reason why males are not interested in the study of Home Economics. If males in secondary schools are given good orientation about the study of Home Economics as a course in tertiary institutions, they may be interested to study it particularly Dike (2006) suggested that if career days are organised by schools from time to time, it will help motivate and stimulate the interests of learners as the learners listen to some experts in the various areas of Home Economics.

f) Teaching of Home Economics

The teaching of Home Economics as a practical subject is crucial if the needed skills, knowledge, value and attitudes are to imparted in the learner. It is critical that teachers have the professional competencies necessary to impact knowledge, skills and attitudes to learners. Hence, teacher education is vital and important as it echoes that in order for teachers to teach effectively there is need to consider the quality of Teacher Education in colleges. Training of teachers is also necessary especially in today’s environment to cope with the changing demands of the profession. As such, proper techniques need to be employed for the teaching and learning process to be real and fruitful. In other words, the quality of teacher education is as good as the quality of the teacher. Teachers are important in any educational system because the quality of the teacher in any educational system determines to a greater extent the quality of the system itself (Adesoum, 2009). The measure of the teachers’ qualification, teaching practice, teacher certification, teacher experience and teaching preparation all define teacher quality. If the quality of teachers is poor, the quality of education will be poor. What this means, therefore, is that the quality of teachers will determine the effectiveness of curriculum implementation. It is understood that teacher education programmes are intended to impart not only a body of knowledge in teacher trainee but also to inculcate in them those skills, competencies and attitudes that would enable them to adapt effectively to the changing demands of the educational system and of the society.

III. METHODOLOGY

The survey research design was adopted for this study for the purpose of assessing factors affecting the choice of Home Economics by male students in the Northern Province of Sierra Leone. The population for this survey study was all year Home Economics students in the Northern Province of Sierra Leone were used for the study. The total number of students offering Home Economics in the Ernest Bai Koroma University of Science and Technology are approximately 250 ranging Teacher Certificate, Higher Teacher Certificate and first degree. The main data collection instrument used for this survey study was the structured questionnaire consisted of demographic characteristics and 5 items representing institutional factors, society factor, student factors, government factors and teaching factors. Students were required to score each of the items between 1 and 5 in their order of importance and representing the extent to which the factor is challenging. A former letter was written to the Registrar of the Ernest Bai Koroma University of Science and Technology to facilitate the administration of the questionnaires through their Head of Department.

The instrument was faced validated by five experts in Home Economics Department of Ernest Bai Koroma University of Science and Technology and corrections and observations were used in the final draft of the questionnaire in order to ensure
content and face validity for the questionnaire. Reliability of the instrument was established by split-half method together with the Spearman’s Brown prophecy Formula which were used to obtain a reliability co-efficient of 0.82.

The researcher administered 120 copies of the instrument to the students by hand delivery and 100 were received making 83.33% return rate. In analyzing the simple percentage score method for each item under each factor were used.

IV. RESULTS

The collected data was analysed by the use of Excel to generate tables and graphs. The figures comprise of gender, age, level and type of institution.

Figure 1. Gender of respondents

The figure above describe the percentage of respondents contacted for this survey study. 80% are males and 20% are females.

Figure 2. Age bracket of respondents

The figure above shows that 10% of the respondents contacted for this survey study are between the ages of 18-23 years, 40% between 23-28 years, 30% between 28-33 and 20% between 33 and above years.
The figure above reveals that 20% of the respondents contacted for this survey study are at certificate level, 30% are at diploma level, 20% are at Higher National Diploma level and 30% at degree level.

The figure above show that 40% of the respondents contacted for this survey study are from Tec-Voc institutions, 35% are from colleges and 25% from university.

The respondents were asked to indicate against each item the following: strongly disagree, disagree, neutral, agree and strongly agree in the ranking of 1,2,3,4 and 5 on the various factors that affect the low intake of male students into Home Economics course.
The above table reveals responses from respondents on institutional factors. With regards to the item "Facilities are not available for teaching and learning," 10% indicated strongly disagree, 8% indicated disagree, 9% indicated neutral, 35% indicated agree and 40% indicated strongly agree. With regards to this item, 10% indicated strongly disagree, 8% indicated disagree, 9% indicated neutral, 35% indicated agree and 40% indicated strongly agree. With regards to learning environment not conducive, 10% indicated strongly disagree, 5% indicated disagree, 5% indicated neutral, 40% indicated agree and 40% indicated strongly agree. With regards to skill content in the course content are inadequate, 10% indicated strongly disagree, 5% indicated disagree, 5% indicated neutral, 40% indicated agree and 40% indicated strongly agree. The table above shows the responses from respondents on student factors. With regards to support system for carrying out practical is weak, 10% indicated strongly disagree, 11% indicated disagree, 9% indicated neutral, 35% indicated agree and 35% indicated strongly agree. With regards to support system for carrying out practical is weak, 10% indicated strongly disagree, 11% indicated disagree, 9% indicated neutral, 35% indicated agree and 35% indicated strongly agree. With regards to financial demand to study Home Economics is too high, 12% indicated strongly disagree, 16% indicated disagree, 7% indicated neutral, 30% indicated agree and 30% indicated strongly agree. With regards to financial demand to study Home Economics is too high, 12% indicated strongly disagree, 16% indicated disagree, 7% indicated neutral, 30% indicated agree and 30% indicated strongly agree. The above table reveals responses from respondents on institutional factors. 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The table above is the responses from respondents on teaching factors. With regards to inadequate trained and qualified lecturers, 10% indicated strongly disagree, 8% indicated disagree, 7% indicated neutral, 35% indicated agree and 40% indicated strongly agree. With regards to shortage of lecturers teaching Home Economics, 9% indicated strongly disagree, 12% indicated disagree, 4% indicated neutral, 30% indicated agree and 45% indicated strongly agree. With regards to lecturer's attitude towards practical class is not encouraging, 10% indicated strongly disagree, 5% indicated disagree, 5% indicated neutral, 40% indicated agree and 40% indicated strongly agree. With regards to job consideration, 10% indicated strongly disagree, 1% indicated neutral, 38% indicated agree and 40% indicated strongly agree. With regards to public apathy toward Home Economics, 15% indicated strongly disagree, 6% disagree, 9% indicated neutral, 40% indicated agree and 30% indicated strongly agree.

Table 4 Society factors

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>%</th>
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</thead>
<tbody>
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<td>1</td>
<td>Public opinion about Home economics for males</td>
<td>10</td>
<td>8</td>
<td>2</td>
<td>35</td>
<td>45</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>Job consideration</td>
<td>9</td>
<td>12</td>
<td>1</td>
<td>38</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>Beliefs and attitudes</td>
<td>12</td>
<td>10</td>
<td>5</td>
<td>40</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>4</td>
<td>Few male lecturers</td>
<td>7</td>
<td>16</td>
<td>7</td>
<td>35</td>
<td>35</td>
<td>100%</td>
</tr>
<tr>
<td>5</td>
<td>Public apathy toward Home Economics</td>
<td>15</td>
<td>6</td>
<td>9</td>
<td>40</td>
<td>30</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table above reveals the responses from respondents on society factors. With regards to public opinion about Home Economics for males, 10% indicated strongly disagree, 8% disagree, 2% indicated neutral, 35% indicated agree and 45% indicated strongly agree. With regards to student perception about Home Economics, 9% indicated strongly disagree, 12% indicated disagree, 1% indicated neutral, 38% indicated agree and 40% indicated strongly agree. With regards to job consideration, 10% indicated strongly disagree, 10% indicated disagree, 5% indicated neutral, 40% indicated agree and 35% indicated strongly agree. With regards to beliefs and attitude, 12% indicated strongly disagree, 10% indicated disagree, 8% indicated neutral, 30% indicated agree and 40% indicated strongly agree. With regards to few male lecturers, 7% indicated strongly disagree, 16% indicated disagree, 7% indicated neutral, 35% indicated agree and 35% indicated strongly agree. With regards to public apathy toward Home Economics, 15% indicated strongly disagree, 6% disagree, 9% indicated neutral, 40% indicated agree and 30% indicated strongly agree.

Table 5 Government factors

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
<th>SD</th>
<th>D</th>
<th>N</th>
<th>A</th>
<th>SA</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate funding</td>
<td>10</td>
<td>8</td>
<td>7</td>
<td>35</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>Inadequate facilities</td>
<td>9</td>
<td>12</td>
<td>4</td>
<td>30</td>
<td>45</td>
<td>100%</td>
</tr>
<tr>
<td>3</td>
<td>Incentives for Home Economics not encouraging</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>40</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>4</td>
<td>Government lukewarm attitude towards Voc/Technical programmes in universities</td>
<td>8</td>
<td>11</td>
<td>6</td>
<td>30</td>
<td>45</td>
<td>100%</td>
</tr>
</tbody>
</table>

The table above is responses from respondents on government factors. With regards to inadequate funding, 10% indicated strongly disagree, 8% indicated disagree, 7% indicated neutral, 35% indicated agree and 40% indicated strongly agree. With regards to inadequate facilities, 9% indicated strongly disagree, 12% indicated disagree, 4% indicated neutral, 30% indicated agree and 45% indicated strongly agree. With regards to incentives for Home Economics not encouraging, 10% indicated strongly disagree, 5% indicated disagree, 5% indicated neutral, 40% indicated agree and 40% indicated strongly agree. With regards to government lukewarm attitude towards Voc/Technical programmes in universities, 8% indicated strongly disagree, 11% indicated disagree, 6% indicated neutral, 30% indicated agree and 45% indicated strongly agree.

V. FINDINGS

Below are findings from the survey study analyzed data. It was found out that 80% of the respondents are males, 40% between 23-28 years, 30% are at diploma and degree level. It was found out that 75% indicated agree and strongly agree to facilities are not available for teaching and learning, 75% indicated agree and strongly agree to no good electricity to empower equipment, 80% indicated agree and strongly agree to learning environment not conducive, 75% indicated agree and strongly agree to skill content in the course content are inadequate, 75% indicated agree and strongly agree to learning resources are obsolete, 78% indicated agree and strongly agree to inadequate facilities and 67% indicated agree and strongly agree to time allot for practical is inadequate. With regards to student factors, 70% indicated agree and strongly to support system for carrying out practical is weak, 70% indicated agree and strongly agree to have poor background on the subjects, 75% indicated agree and strongly agree to most students are lazy, 70% indicated
agree and strongly agree to most students in Home Economics lack creativity, 65% indicated agree and strongly agree to financial demand to study Home Economics is too high and 75% indicated agree and strongly agree to have no interest in Home Economics as a course. With regards to teaching factors, 75% indicated agree and strongly agree to inadequate trained and qualified lecturers, 75% indicated agree and strongly agree to shortage of lecturers teaching Home Economics, 80% indicated agree and strongly agree to lecturers attitude towards practical class is not encouraging, 75% indicated agree and strongly agree to lecturers do not come to lecture regularly, 75% indicated agree and strongly agree to methods utilized for Home Economics courses are uninteresting.

With regards to society factors, it was found out that 80% indicated agree and strongly agree to public opinion about Home economics for males, 78% indicated agree and strongly agree to student perception about Home Economics, 75% indicated agree and strongly agree to jobb consideration, 70% indicated agree and strongly agree to beliefs and attitudes, 70% indicated agree and strongly agree to few male lecturers and 70% indicated agree and strongly agree to public apathy toward Home Economics.

With regards to government factors, 75% indicated agree and strongly agree to inadequate funding, 75% indicated agree and strongly agree to incentives for Home Economics not encouraging and 75% indicated agree and strongly agree to Government lukeworm attitude towards Voc/Technical programmes in universities.

VI. CONCLUSION

From the findings it can be concluded that; there is a low enrollment of male student into Home Economics in the Northern Province of Sierra Leone, the few Voc/Technical Institutions are challenged ranging from inadequate funding, infrastructures, modern facilities and electricity to enhance kitchen equipment. Male students are not interested in Home Economics course as it is considered female course, limitation in terms job seeking, the perception of the public about a male student offering Home Economics course and finally, the government of Sierra Leone is payin lukeworm services to these institutions offering Home Economics.

RECOMMENDATIONS

From the conclusion the following are recommended:

**Government to:**

- Build more technical and vocational centres in the Northern province that cater for even the non-formal sector;
- Provide adequate funds or grant to support these institutions so that it can enhance their capacity to accommodated more students;

**Institutions to:**

- Review their curriculum on Home Economics to make it interesting and allot enough time for practical;
- Recruit trained and qualified lecturers to lecture Home Economics;
- To introduce career guidance counsellors where students will be adequately oriented of the career path;
- Create a conducive environment for Home Economics practical equipped with modern equipment;
- Revisit the cost of offering Home Economics as compared to other courses like business, human resource management to new a few;
- Home Economics Departments start to recruit male lecturers if they are available so that male students will see them as means of encouragement;
- Home Economics Departments to introduce incentives that will make the Home Economics interesting in order to attract male student.

**REFERENCES**


**AUTHORS**

**First Author** – Fatmata Helen Kabia, Department of Culinary Services and Domestic Arts, Makeni Campus, Ernest Bai Koroma University of Science and Technology fhkabia@ebkust.edu.sl
Professional Conduct Reforms and Service Delivery by Kenya Police Service in Homa Bay County, Kenya

Gorety Achieng Odhiambo, Jane Wanjira

School of Business, Kenyatta University, Nairobi, Kenya

** Professional Conduct Reforms, Training programs, Performance reviews, Provision of equipment/machines, Service delivery.**

Abstract- Unmet demands and expectations and poor service delivery in public entities, has pushed people to demand for reforms for improvement of service delivery by the Kenya police service. Thus, the study sought to assess the effect of professional conduct reforms on service delivery by the Kenya police service in Homa Bay County, Kenya. The study was anchored on core competence theory and adopted the cross-sectional research design. The target population was the 29 police stations in Homa Bay County and 77 police officers from different ranks. Both qualitative and quantitative data was collected and analyzed through descriptive, correlation, regression and content analysis. Findings from descriptive analysis showed high scores for professional conduct reforms (M=3.84) and service delivery (M=4.065) an indication that respondents agreed to the association between the two variables. The correlation analysis results revealed positive and significant effects professional conduct reforms of (β = 4.108). The study also found that 74.9% service delivery of the police officers in Homa Bay County was due to adopting professional conduct reforms. Based on these findings, the study concluded that improved service delivery was due to implementation of professional conduct reforms. The study recommends inclusion of all police officers, the general public and local communities in police reforms for enhanced quality service delivery.

Index Terms- Professional conduct reforms, Training programs, Performance reviews, Provision of equipment/machines, Service delivery.

I. INTRODUCTION

Services hold an integral part of the economy in many nations; hence governments and administrative units work hard to improve and deliver quality services to the masses. In market context, service delivery is about providing quality services that respond to the market and clientele needs and expectations. According to Wahida (2016) service delivery is viewed differently from the public sector as it is about social responsibility while in private sector it is profit maximization. YuSheng and Ibrahim (2019) define service delivery as creation of value to the consumers of a certain product such as to pique their interest which will lead them to make a purchase. Giri, Shakya and Pande (2018) share that services are intangible products offered to the public and its measure is based on feelings and perceptions hence the need to have qualified and competent staffs.

Delivery of services within public sector is important as shared by Steiner, Kaiser, Tapscott and Navarro (2018) since it involves utilization of taxes that are collected from all people. Basically, the government runs its functions using public funds hence the need for quality services delivered to the citizenry. Ndubai, Mbeche and Pokhariyal (2016) simply states that service delivery is the right of every citizen and its quality must be assured by the government agencies and departments. To attain quality service delivery, organizations and institutions have formulated and implemented strategies that align with the agenda (Obadha, 2018). The service delivery in developing countries and especially in the African public sector is reported as problematic despite the efforts by governing agencies to change the trend.

According to a study by Brinkerhoff, Wetterberg and Wibbels (2018) reports that service quality is still low and in its infant stages due to reasons such as poorly motivated staff, lack of skilled personnel and lack of tools and logistics among others. The observations that if developing countries are to efficiently deliver services, then it should strictly start with the government, political leaders, civil and public servants, and then individual citizens who should ensure that service delivery is implemented in a right way as planned by rightful/top authorities and according to their needs and right of way (Dabestani, Shahin, Shirouyehzad & Saljoughian, 2017). In most cases, the poor and rural communities are affected the most when it comes to services that are poorly delivered by public sector actors. This is mainly due to unfair and unequal distribution of public resources such as funds. The urban cities receive huge amounts of government resource allocation as compared to the small, rural, and marginalized areas.

To improve quality of services delivered to the public, Henry, Nantongo, Wagner, Embrey and Trap (2017) advocates for supportive supervision and public awareness, Molina, Carella, Pacheco, Cruces and Gasparini (2017) share on the need for local communities to monitor the progress of different projects and programs initiated by the government to curb cases of corruption and delivery of high-quality services. Poor service delivery
occasioned by lengthy queues, delaying of services and bribery and making payments for services meant to be freely given (Ndubai, et al., 2016). Which led to formulation of the Huduma centres – a one-stop shop for all public services given to Kenyans. For the police service, quality service delivery will involve accuracy in reporting incidences, tracking and tracing of an incidence during audits, handling issues as per the law, and proper recording of incidences (Steen, Teles & Torsteinsen, 2017). It is also about openness and transparency when making arrests, investigations, going through the legal process and charging suspects with the crimes that they have committed. This can be attained through strategic reforms such as professional conduct reforms. Which involve the behavior of people at the workplace based on their attitudes, appearances and conduct. Poppe (2021) assert that it covers the way one speaks, look, acts and make decisions concerning different aspects of the work assignments. Thompson and Payne (2019) stated that police officers must behave in a professional manner to legitimize their trade and also offer their services to the general public citizenry in a fair and equitable manner. The reforms to enhance professional conduct through trainings and its content must be relevant to societal issues. There is also need to learn on work-life balance aspects to motivate the policemen and women. Aywekanbe (2020) revealed that the police officers need equipment and tools of trade to ease their work roles.

The National police service is often rated poorly in terms of service delivery and also tops in corruption as based on the bribery index report in East Africa. There has been an increase in corruption index from 77.7% in 2011 to 81% in 2016. These challenges caused the push for reforms in the security docket that started back in 2009. The reforms also aim at changing the narrative of police officers serving the interests of the rich and political class in the country while neglecting the poor public. The reforms are expected to usher new spectrum in the NPS and are based on culture, people-management, partnership and linkage and addressing infrastructure gaps (Mageka, 2015). Thus, the study focus was on how professional conduct reforms impact on service delivery.

The study sought to answer this research question:

1. How do reforms in professional conduct affect the public service delivery at the police service in Homa Bay County, Kenya?

II. LITERATURE REVIEW

Theoretical Literature Review

Core Competence Theory

It was forwarded by Hamel and Prahlad (1990) and it works to showcase the actions that organizations and business entities take to identified new opportunities to grow the business and gain competitive advantage. It also harmonizes the resources, skills, and capacities of the organization in such a manner to be unique and gain competitiveness. Ljungquist (2008) shared that the core competencies are based in three criteria potential for access to wider market options, contribute significantly to the customers and market benefits and inability to easily be imitated by other market players and competitors.

The theory has been critiqued for limiting the capability for firms to adapt to changing environments. Schaupp and Virkkunen (2017) shared that the theory focuses on core competencies without consideration for other approaches that can be employed to improve performance and productivity. As such, it ignores the human element which can disastrous for service-based industries.

The core competencies that an organization can use is communication and Iormen and Adikpo (2020) share that it includes skills, knowledge and experiences that are shared to others in the organizations and leads to development of new ideas that help in satisfying the needs of the market. The second is thinking competency and according to Gupta (2013) that covers the knowledge, skills and processes we associate with intellectual development. It further includes cognitive awareness, specific thinking skills and mind and its thoughts to understand impact of competencies in improve service delivery. Improving competencies of the police officers can be done through professional conduct training to equip the officers with knowledge and skills.

Empirical Literature Review

Kennedy, Reast, Morrow, Bourke, Murphy, Arnett, and Bradley (2019) conducted a study that sought to improve professional conduct and competencies of Irish pharmacists. The findings showed that from almost 3,000 pharmacists who had enrolled in ePortfolio and participated in ePortfolio Review by April of 2019 in the first three years, 96.2% showed an increased and improved engagement in continuous professional development and those who did their reviews in the last two years, 97.5% showed the required standards of competence and professional development. It was concluded that engagement in continuous professional development through continuing education led to improved competency for the professionals.

Njungu, Ndung’u and Achilles (2015) study was on institutionalizing the Kenyan police professional reforms and what lessons are learned from the 2012–2015 period. This brief from the three-year program reveals that collaboration between the partners (program partners, local community members and national police service) led to improved service delivery. It also revealed that community security approach led to safer world for locals and community and police engagement and consultation of improved service delivery.

A study by Thompson and Payne (2019) examined how to increase professionalism and legitimacy in the Ireland police forces and through education and training of the police officers. The study revealed that when the police service members have professional learning up to university level, this led to increased legitimacy of the police and service and helped their professional conduct. Findings also showed that education and training led to better police culture and helped to build collaborative structures with public for enhanced community policing. The conclusions showed that police ethics and culture were still lacking and thus recommendation for increased professional learning and education was called upon to improve police service delivery.

A study by Gajić (2017) investigated professional conduct and capacity building reforms in the Kosovo security sector, by analyzing the security sector in the country for two decades and evaluating the approaches that international communities have taken in elevating activities for public service deliveries. The study revealed that professional conduct and capacity building in the security forces should be based on conditions and issues in the
society; the public should help the security actors to respond accordingly to the present concerns and situations.

Conceptual Framework

III. RESEARCH METHODOLOGY

Cross-sectional descriptive research design was employed in the study for providing a guideline in conducting all research activities. According to Bryman and Bell (2015) the design enabled the study to count, classify and compare results from across elements and descriptively report things as accurately as they occurred. The target population was the 29 police stations spread across the 8 sub-counties in Homa Bay County. This was the unit of analysis, while the unit of observation included 77 members distributed as 1 County Commander from Kenya Police and Administration Police; 1 Deputy County Commander of Kenya Police; 8 Sub-County Commanders of Administration Police and the Officer(s) and Deputy Officer(s) in charge of the 29 police stations.

Primary data was collected using self-administered semi-structured questionnaires that enabled the researcher obtain both qualitative and quantitative data. The data was collected using the drop and pick later method to increase response rate and avoid interfering with the work schedules of the police officers. All the data was then coded and entered into SPSS version 25.0 for analysis. Quantitative data was analyzed using descriptive format to obtain averages, frequencies and variances and inferentially through multiple linear regression and correlation to indicate the relations, direction and strength between the study variables. Content analysis was done on the qualitative data by arranging the information as per themes.

Diagnostic tests were conducted to check for any violations made based on assumptions in the regression model. This was done through test of multicollinearity and using the Variance of Inflation Factor (VIF) and the test of autocorrelation with the use of Durbin Watson statistics for detecting lag 1 in the regression analysis residual.

IV. RESEARCH FINDINGS AND DISCUSSIONS

The researcher conducted a descriptive analysis and obtained means and standard deviations. The analysis applied a five-point likert scale with ranges 1 to 5, where 1=not at all; 2=strongly disagree; 3=disagree; 4=agree; 5=strongly agree. These are the results

<table>
<thead>
<tr>
<th>Professional Conduct Reforms</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The police officers are offered trainings on acceptable professional conduct</td>
<td>3.84</td>
<td>1</td>
</tr>
<tr>
<td>The police officers are trained on handling the situation during operations</td>
<td>4.043</td>
<td>0.628</td>
</tr>
<tr>
<td>There is improvement in the general outlook of the police officers</td>
<td>4</td>
<td>0.804</td>
</tr>
<tr>
<td>The police officers follow the direct orders given by their superiors</td>
<td>3.971</td>
<td>0.727</td>
</tr>
<tr>
<td>The police officers operate as per the standards of operations</td>
<td>3.927</td>
<td>0.828</td>
</tr>
<tr>
<td>There is professional development for the Kenya police officers</td>
<td>3.754</td>
<td>0.976</td>
</tr>
<tr>
<td>The legitimacy attained by police officer is through education and training programs</td>
<td>3.956</td>
<td>0.991</td>
</tr>
<tr>
<td>The current ethics at the police stations has greatly improved</td>
<td>3.884</td>
<td>0.899</td>
</tr>
<tr>
<td>The work culture at the police station has improved</td>
<td>4.028</td>
<td>0.803</td>
</tr>
</tbody>
</table>

**Aggregate Scores**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.84</td>
<td>0.851</td>
</tr>
</tbody>
</table>

Table 1 indicates that respondents agreed to a great extent that professional conduct reforms affected service delivery of police officers in Homa Bay County based on aggregate scores of M = 3.84 and SD = 0.851. Poppe (2021) asserted that professional
conduct reforms worked on the attitudes, appearance and displayed manners of people at the workplace. While Thompson and Payne (2019) revealed that police officers must behave in a professional manner for legitimacy of their trade and offer fair and equitable services to the public. Furthermore, Gajić (2017) noted that enhanced capacity building improved approaches in handling public issues and Obadha (2018) shared that trainings provided to the officers should cover the prevailing societal problems. There is also need for constant reviews, as shared Kennedy, et al. (2019) is needed for checking that police officers adhere to the standard operating procedures. In addition, Njuguna, et al. (2015) shared that professional reforms at the Kenyan police through collaborations with local partners improved service delivery to the general public.

Table 2: Service Delivery

<table>
<thead>
<tr>
<th>Service Delivery</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police fairly handle issues raised by the public</td>
<td>3.841</td>
<td>0.778</td>
</tr>
<tr>
<td>Police service quickly responds to public issues</td>
<td>4</td>
<td>0.874</td>
</tr>
<tr>
<td>The police handle the public with dignity</td>
<td>4.014</td>
<td>1.007</td>
</tr>
<tr>
<td>Police ensure maintenance of the lawful</td>
<td>4.333</td>
<td>0.779</td>
</tr>
<tr>
<td>Police protects both life and properties of the people</td>
<td>4.42</td>
<td>0.774</td>
</tr>
<tr>
<td>Police are honest in carrying out their duties</td>
<td>3.783</td>
<td>1.082</td>
</tr>
<tr>
<td>Aggregate Scores</td>
<td>4.065</td>
<td>0.882</td>
</tr>
</tbody>
</table>

Table 2 shows that there was improved service delivery in the police stations across Homa Bay County, based on the high aggregate scores of M = 4.065 and SD = 0.882. Just as Obadha (2018) revealed that reforms made at the National Police Service has led to openness, transparency and collaboration with the citizens that has improved investigations, legal proceedings and crime rates. In addition, Njue and Ongoto (2018) noted that reforms improved performance outcome through changing the leadership, culture and empowering employees. YuSheng and Ibrahim (2019) noted that police reduce crime by collaboratively working with local communities and community policing units. The police with involvement of the communities protect life and property. Dabestani, et al. (2017) talks of fast response to emergencies while Steen, et al. (2017) noted the need for accurate reporting of incidences and Topister (2021) argues for formulation and implementation of reforms in the police service.

Table 3: Correlation Analysis Results

<table>
<thead>
<tr>
<th>Service Delivery</th>
<th>Pearson</th>
<th>Professional Conduct Reforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>1</td>
<td>.755*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.001</td>
<td>.69</td>
</tr>
<tr>
<td>N</td>
<td>69</td>
<td>69</td>
</tr>
</tbody>
</table>

Table 3 imply that there was positive and significant effects were found for professional conduct reforms and service delivery in police stations in Homa Bay County at R = 0.755 and p-values of 0.00 < 0.05. The findings can be interpreted to mean that improvement in service deliver was largely influenced by reforms on professional conduct of the police officers. Similar to what Kennedy, et al. (2019) shared that continuous professional development programs for staffs, increases their competencies and capabilities that is reflected in quality of service delivery.

Diagnostic tests were conducted to check that the assumptions made do not violate the model and it also ensures the suitability of the data set in regression modeling.

Table 4: Test of Multicollinearity

<table>
<thead>
<tr>
<th>Collinearity Statistics</th>
<th>Tolerance</th>
<th>VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional Conduct Reforms</td>
<td>.431</td>
<td>2.320</td>
</tr>
<tr>
<td>Mean VIF</td>
<td>.431</td>
<td>2.320</td>
</tr>
</tbody>
</table>

Table 4 indicates that the obtained VIF is below 4 and within the standard range of 0-10. The tolerance value averaged at .4 and based on stipulations made by Kothari (2011) such that tolerance values closer to 1 imply little multicollinearity and those closer to 0 suggest presence of multicollinearity. From the findings of the VIF and tolerance indicate absence of multicollinearity and hence the data set is ideal for regression modeling.

Table 5: Autocorrelation Test

Model | Durbin-Watson |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.874</td>
</tr>
</tbody>
</table>

Table 5 gives a summary of the results from the conducted autocorrelation test with the Durbin-Watson statistical findings found to be 1.874. When the figure is rounded off to the nearest whole number, then it will be 2 and indication of positive autocorrelation. These results indicate that there was absence of serial correlation and imply that the data set is suitable for conducting regression analysis.

Table 6: Model Summary

<table>
<thead>
<tr>
<th>ModelR</th>
<th>Adjusted R Square</th>
<th>R Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.874*</td>
<td>.763</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Professional Conduct Reforms

Table 6 show that correlation coefficient of R is at 0.874, implying strong and positive relations between professional conduct reforms and service delivery by the Kenya police service in Homa Bay County. The coefficient of determination is presented by R square at 0.763 showing that the overall regression model is fit. The adjusted R square is given at 0.749 meaning that professional reforms at the Kenyan police through collaborations with local partners improved service delivery to the general public.

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74.9% change in service delivery by the police officers in Homa Bay County is explained by professional conduct reforms.

### Table 7: Goodness of Fit

<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>213.540</td>
<td>1</td>
<td>213.540</td>
<td>141.51</td>
<td>.001b</td>
</tr>
<tr>
<td>Residual</td>
<td>101.134</td>
<td>67</td>
<td>1.509</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>314.674</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Service Delivery  
b. Predictors: (Constant), Professional Conduct Reforms

The ANOVA test was done at 0.05 significance level where the F calculated was found to be 141.51 and F critical found to be 3.984. The results showed that F calculated is greater than F critical (141.51 > 3.984), which is an indication that the adopted regression model is ideal and fit for use in the current research study. The p-value is 0.01 < 0.05 implying that professional conduct reforms had significant effects to service delivery by the police officers in Homa Bay County.

### Table 8: Regression Coefficient

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>I (Constant)</td>
<td>6.833</td>
<td>.704</td>
</tr>
<tr>
<td>Professional Conduct Reforms</td>
<td>4.108</td>
<td>1.348</td>
</tr>
</tbody>
</table>

The Resulting Equation takes this form:  
\[ Y = 6.833 + 4.108X \]

Professional conduct reforms had positive and significant effects to service delivery of the police officers in Homa Bay County; the results were Kenya (\( \beta = 4.108, p = 0.016 < 0.05 \)). The police officers are trained on the acceptable professional conduct, handling different situations during operations, ethics and work culture. These trainings have led to improvements when handling work tasks and adhering to direct orders, which results in better service delivery to public. The police officers currently handle the public with dignity, quickly respond to public issues and protect the life and property of the masses.

V. CONCLUSIONS AND RECOMMENDATIONS

The findings indicate that professional conduct reforms had a high effect to service delivery of the police officers in Homa Bay County. Therefore, this study concludes that offering trainings on professional conduct and handling of situations, following direct orders and the stated standard operating procedures and adjustments on the work culture and ethics; improved the quality of services delivered to the people of Homa Bay County. The study concludes that reforms on professional conduct led to improved service delivery in the police officers in Homa Bay County. The police officers are behaving in an acceptable professional conduct and they are handing their work duties as per the standard operation procedures and direct orders from senior officers. The adopted work culture and ethical conduct has improved quality of services delivered by the police officers to the general public.

Service delivery in this study was based on elements such as fair and quick response to issues, handling the public with dignity and maintaining law and order. It was also measured using aspects of protection of life and property of the people and police officers being honest while carrying out their duties. To achieve quality service delivery by the police officers, they adopted professional conduct reform practices. The study concluded that professional conduct reforms led to improved service delivery of the Kenya police service in Homa Bay County.

This study recommended that all police officers to be given trainings on professional conduct, on how to handle operations, ethics and work culture. Offering professional development courses and trainings will enhance legitimacy of the service and improve service delivery. To enhance service quality, then all the police officers must behave and conduct their duties in a professional manner. Since professional conduct reforms had a high effect on service delivery, this study recommend improvements made on professional development, educational and training programs for the police officers. Improving the knowledge base of the police officers will keep enhancing service quality offered to the general public.

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AUTHORS
First Author – Gorety Achieng’ Odhiambo, School of Business, Kenyatta University, Nairobi, Kenya
Second Author – Jane Wanjira , School of Business, Kenyatta University, Nairobi, Kenya
Diagnosis of congenital anomalies, its demographic patterns and associated maternity risk factors among children hospitalized at Lal Ded Hospital, Srinagar

Umer Hamid 1, Shazia Bashir 2 and Farhat Jabeen 3

1-2 Resident Department of Obstetrics and Gynecology, Maternity Hospital (tertiary health care setting), Government Medical College (GMC), Anantnag, Jammu and Kashmir
3 Prof (Dr) Farhat Jabeen Department of Obstetrics and Gynecology GMC Srinagar

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Abstract: Congenital anomalies (CAs) are a major cause of stillbirths and neonatal mortality in India. The extent and patterns vary over time and across different geographical locations. The objective of the study was diagnosis of CAs using ultrasound (USG), different demographic patterns, types of CA, mode of delivery, gestational age and associated maternal risk factors in both booked and unbooked urban and rural pregnant women at Department of Obstetrics and Gynecology, Lal Ded Hospital (tertiary health care setting), Government Medical College (GMC), Srinagar. Pregnancy outcome of both booked and unbooked pregnant women were followed till delivery for the ascertainment of CAs. The congenital abnormalities were detected during antenatal period using ultrasonography (USG), after delivery and abortion. A total of 5539 mothers were followed till their pregnancy outcome was recorded. Among them 5500 live births were recorded. Rate of incidence of CAs were 0.9/1000 live births. The unbooked women showed indices of 64%, while as, the booked women carried 36% of CAs. Further, rate of CA was comparatively higher among rural women (74%) as compared to the urban women (24%). The pattern in the incidence of CAs observed with regards to parity indicated that multiparity and primiparity women had 64- and 36% CAs, respectively. Results also indicated that incidence of CAs were higher among preterm (64%) than full term births (16%). About 80% of all CAs were diagnosed on USG while as only 20% of CAs were found among non diagnosed participants post delivery. The major maternal risk factors for CAs included polyhydramnios (32%), anemia (24%) and oligohydramnios (20%). Other risk factors included history of previous C (16%), breech (10%), Rh negative condition (10%), and events of having twins (4%). Association of CAs with gender was primarily more linked to males (60%) in contrast to females (40%). High percentage of CAs was associated with live (40%) and still births (40%), and a comparatively low level was associated with aborted cases (20%). The predominant defects were observed in CNS (52%) followed by the musculo-skeletal defects (32%), renal (16%), abdominal wall (16%), and cardiac defects (8%). The results of the study indicate that CAs continue to occur majorly among rural women with multiple associated risk factors when compared to the urban women.

I. INTRODUCTION

Congenital anomalies (CAs) or birth defects usually include structural or functional irregularities of prenatal origin, resulting from an abnormality occurring during the development process (Ameen et al., 2018). Medical science attaches a lot of value to CAs for various reasons, for example, CAs can be a significant parameter to tackle or reduce neonatal mortality (Ara et al., 2018). An Indian cohort study established that CA rates are affecting one in forty four births and the prevalence was identical to the stillbirth prevalence, highlighting its public health importance (Bhide et al., 2016). Since all congenital anomalies are not lethal, thus, the children born with several non-fatal anomalies survive with disability or need lifelong care, leading to huge out-of-pocket expenditure for families (Liu et al., 2016). While CAs are the leading cause of death in children in children less than five years of age in the high-income countries, they are not considered to be significant public health problems in low- and middle-income countries (LMICs) due to public health under-prioritization in such countries (Bhide et al., 2016). The leading causes of infant morbidity and mortality in LMICs countries include malnutrition and infections, whereas cancer, accidents and congenital malformations are considered as leading cause in rich countries (Doddabasappa et al., 2018).

According to a study conducted by World Health Organization (WHO), 17 - 42% of infant mortality was attributed to congenital anomalies (Boyle et al., 2018). This study also documented that ignoring termination of pregnancy with congenital anomaly and stillbirths underestimates the global burden of disease and obscures lack of progress in primary, secondary and tertiary prevention. CAs account for about 8-15% of perinatal deaths and 13-16% of neonatal deaths across the India (Doddabasappa et al., 2018). Birth related anomalies such as congenital heart disease caused 261 247 deaths globally in 2017 among infants aged less than one years (Zimmerman et al., 2020). Among other documented CAs include kidney and urinary
tract anomalies (Viswanathan et al., 2020), preterm births, intrapartum complications, neonatal sepsis, pneumonia (Bhide et al., 2016), orofacial defects such as cleft palate and cleft lip (Neogi et al., 2017), etc. Anomalies in central nervous system, birth weight, gestational age, male sex, consanguineous marriage, maternal obesity and previous family history of CAs were significantly associated with increased risk of CAs (Pandala et al., 2019). Analysis of nationwide data showed that two most frequently reported anomalies in India are anencephaly which is preventable via preconception folate supplementation, and talipes which can be prevented using low cost interventions (Bhide & Kar, 2018).

Prevalence rates of CAs recorded in developing countries are likely to be underestimated due to limited of diagnostic facilities or accurate medical records (Ameen et al., 2018). A community based study indicated that mothers with risk factors like extreme of ages, illiteracy, worse obstetric history, and history of CAs in previous babies are at increased risk of fetal congenital malformation (Malik et al., 2019). In a large study from South India, high prevalence of CAs was found in high risk pregnant (HRP) women when compared to general population, while as low parental age was contributed toward CAs in primiparity women and the consanguinity was also found to be a predisposing factor for CAs in HRP with previous bad obstetric history (Sunita et al., 2017). Usually the major risk factors for CAs include maternal age, drug intake, teratogens, radiation exposure, maternal illnesses, smoking, and alcohol consumption (Wagner et al., 2019). Maternal diseases such as rubella infections, diabetes mellitus, hypothyroidism, folic acid deficiency, exposure to alcohol and environmental chemicals are all other factors that cause birth defects (Doddabasappa et al., 2018). For accurate and robust testing of CAs, the physicians mostly rely on imaging such as ultrasound and magnetic resonance imaging (MRI). The other antenatal screening methods include maternal serum markers, chorionic villus sampling, amniocentesis, and cordocentesis (Wagner et al., 2019).

This study aimed at presenting the spectrum of various CA, demographic patterns, associated maternal risk factors and their outcome on CAs, among both booked and unbooked urban and rural pregnant women, for period of 18 months (March 01, 2018 to August 01, 2019).

II. MATERIALS AND METHODS

Hospital settings and ethics approval

The current study was conducted at Lal Ded Hospital (tertiary health care setting), Government Medical College, Srinagar, under supervision of Prof (Dr.) Farhat Jabeen, Head of Department, Department of Obstetrics and Gynaecology, with proper approval from Institutional Ethical Committee GMC, Srinagar (Ethical committee report no ).

Participants in study

Pregnant women, both booked and unbooked between time period March 01, 2018 to August 01, 2019, at Department of Obstetrics and Gynaecology, Lal Ded Hospital (tertiary health care setting), GMC, Srinagar, were scrutinized for congenital abnormalities (CAs). All CAs were detected either during the antenatal period by ultrasonography (USG), or after delivery and abortion. The record potential participants (pregnant women) were maintained by health staff of Lal Ded Hospital, GMC, Srinagar.

Period of the study

Total period of study was 18 months (March 01, 2018 to August 01, 2019) keeping feasibility, manpower and resources in consideration.

Other formalities

Oral consent was taken from every participant before collecting any information. All unbooked participants were enquired whether or not they have undergone USG or any other radiological investigation. They were also requested to enquire whether any pregnant woman has undergone USG or any other radiological investigation to ascertain whether she was diagnosed with any CA on making a home visit. The workers were advised to keep the detailed address and phone numbers of such women with them so that such women were traced and followed up later by the investigator.

Other details obtained from participants include exposure to any risk factor, history of previous child births, and any other illness among participants. History, examination recordings and USG findings were documented in detail. The booked participants were kept under constant supervision till completion of the study to record any CAs manifestations. All CAs recorded were classified by organ system according to the 10th version of the WHO International Classification of Diseases (ICD-10) (WHO, 1992).

Analysis of data

Data were analyzed using computer software MS Excel. The patient’s characteristics were reported as percentages (%) as considered appropriate.

III. RESULTS AND DISCUSSION

Participants

A total of 5539 antenatal women including both booked and unbooked at Department of Obstetrics and Gynaecology (OB/GYN), Lal Ded Hospital, GMC, Srinagar during March 01, 2018-August 01, 2019 (18 months). Total number of 5500 live births was recorded by medical staff of hospital. A total of 50 children (30 males and 20 females) had CAs and were recorded and classified as per ICD-10 of WHO (1992). Out of total 50 babies had CAs resulting in the incidence rate of 0.9/1000 live births (approximately). Most of the neonates had single CA, while few of them had multiple CAs.

Demographic pattern of CAs

The current study covered various demographics of CAs among rural/urban, booked/unbooked and primi-/multiparity among pregnant women at Lal Ded Hospital, GMC, Srinagar. Results showed that CAs were seen more commonly seen in rural women (76%) as compared to the urban women (24%). The possible reason for higher rates of CAs found among rural women due to limited resources and advanced diagnostic techniques available in such areas (Ara et al., 2018), lack of appropriate genetic counseling (Doddabasappa et al., 2018) among other factors. Both booked and unbooked pregnant women were accessed for the rate CAs and the study outcomes showed that
booked exhibited lower rates of CAs (34%) compared to unbooked women who showed 64% CA rate, possibly due to early antenatal scans that helps in prior detection of CAs and possible medical interventions. Another study showed that malformations among newborns born to unregistered mothers were significantly high (Baruah et al., 2015). Current study also established a close association between maternal parity and birth defects. Results showed that multiparity is associated with an increased rate of birth defects (64%) compared to primiparity (36%). Some studies show that primiparity was more likely to be related to adverse maternal outcomes (Schimmel et al., 2015; Wang et al., 2011) while some studies have shown significant association between multiparity and the occurrence of CAs (Jawad et al., 2017; Pandala et al., 2019).

Diagnosis of CAs using USG

The ultrasound (USG) is the most widely used diagnostic tool in obstetrics for detection of developmental disorders among new children prenatally with great certainty (Erős & Beke, 2017). In the current study, USG was employed as main diagnostic tool and the sensitivity in the detection of CAs was significantly helpful among pregnant women. Maximum percentage (80%) of CAs were detected using USG, while as a comparatively small percentage (20%) of CAs among pregnant women were diagnosed with diagnostics other than USG. Kashyap et al. (2015) also documented 50% early detection of malformation using first trimester USG at tertiary care centre in India, thus, highlighting the need of early diagnosis and timely intervention of prenatal CAs detection using USG.

Delivery mode and age of gestation in case of children born with CAs

In the current study, the mode of delivery and gestational age was recorded for both booked and unbooked pregnant women. In this study, it was seen that 68% of children with CAs were born via vaginal delivery, 20% were aborted fetuses, and 12% of children were born by Lower (uterine) Segment Caesarean Section (LSCS). The gestational age of children with CAs were mostly born through preterm deliveries (64%) with respect to full term deliveries (16%).

Association of CAs with gender and type of birth in children

In most of the studies, there has been no gender difference in indices of CAs, however, present study found a higher association of CAs with males (60%) as compared to females (40%). Similarly, among CAs positive cases, 296 fetuses were males, while as 274 cases had female gender (Rehan et al., 2019).

Furthermore, prevalence of CAs was similar in live and stillbirth (each 40%), however, higher than rate of CAs in abortive mode deliveries which was only 20%. Similarly, prevalence of congenital malformations was found identical in live and stillbirth in the cohort study carried out by Bhide et al. (2016). However, in another study, the incidence of congenital malformations was higher among abortions and preterm deliveries when compared to stillbirths (Kanhere et al., 2015).

Different types of CAs in children

In this study, central nervous system (CNS) was the most common system (52%) involved followed by musculoskeletal malformations (32%) (Fig. 1). Percentage of renal and abdominal wall defects occurred at same rate (16% each), while as minimum percentage of cardiac malformations (8%) was documented in the study. Kanhere et al. (2015) also observed CNS as most common CA followed by musculo-skeletal defects. In another study, CNS defects were the most recognisable malformations at birth as gastrointestinal- and cardiovascular system (Pandala et al., 2019). Similarly, 74.4% of patient had CNS congenital anomaly, and the most common anomaly was anencephaly followed by meningocele/myelomeningoceles (Jain et al., 2018). Unlike our results, Dewangan et al. (2016) found that majority of the CAs were associated with musculoskeletal system (58%) followed by cardiovascular (28%) and genitourinary (18%). Furthermore, our study found that CNS malformations were better detected in the antenatal USG than any other procedures.
Association of gestational age of babies with CAs

Regarding the gestational age of the malformed neonates, present study found a significantly increased incidence of CAs among preterm neonates (64%) than full term (16%). Similar observation were made by Doddabasappa et al. (2018).

Various maternal risk factors and their associated with CAs

Multiple maternal risk factors associated with CAs noted in this study include polyhydramnios (excess amniotic fluid in the amniotic sac), anemia, oligohydramnios (less amniotic fluid in the amniotic sac), previous C-section, breech, Rh negative and twins (Table 1). All such maternal risk factors lead to CAs such as malformations in CNS, musculo-skeletal defects, renal, abdominal wall and cardiac defects. Our findings were similar to congenital anomalies (CNS, gastrointestinal and musculoskeletal) reported by Rathod & Samal (2020). Invasive antiretroviral therapy, primiparity, pregestational overweight and obesity, folic acid deficiency and smoking were identified as risk factors for vertebral defects, anal atresia, cardiac defects, tracheo-esophageal fistula, renal anomalies, and limb abnormalities (Van de Putte et al., 2020). Nitrate exposure was associated with a significantly increased risk of limb deficiencies, and weakly associated with an increased risk of congenital heart- and neural tube defects (Blaisdell et al., 2019).

Table 1— Risk factors and their association with CAs

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyhydramnios</td>
<td>32</td>
</tr>
<tr>
<td>Anemia</td>
<td>24</td>
</tr>
<tr>
<td>Oligohydramnios</td>
<td>20</td>
</tr>
<tr>
<td>Previous C-section</td>
<td>16</td>
</tr>
<tr>
<td>Breech</td>
<td>10</td>
</tr>
<tr>
<td>Rh negative</td>
<td>10</td>
</tr>
<tr>
<td>Twins</td>
<td>4</td>
</tr>
</tbody>
</table>

IV. CONCLUSION

Current study tried to understand the prevalence of congenital anomalies (CAs) among women treated (booked/unbooked) at Lal Ded Hospital, GMC, Srinagar. We found a huge rural/urban divide in terms of percentage of CAs in both booked and unbooked pregnant women. Besides, a huge variation was found in terms of percentage of CAs in primiparity and multiparity cases. Our study showed that quality USG screening can increase the detection rates of fetal malformations during prenatal period. Furthermore, rate of CAs showed huge variations with respect to mode of deliveries. The most common CAs included defects in CNS musculoskeletal system. Polyhydramnios, anemia, oligohydramnios, previous C-section, breech, Rh negative and twins were the common maternal risk factors that led to different types of CAs reported in the study. Thus, study concludes that public awareness about preventable risk factors is to be created and early prenatal diagnosis and management of common anomalies is strongly recommended. An early diagnosis and management can result in better outcome of these newborns with CAs.


**AUTHORS**

**First Author** – Umer Hamid, Resident Department of Obstetrics and Gynecology, Maternity Hospital (tertiary health care setting), Government Medical College (GMC), Anantnag, Jammu and Kashmir

**Second Author** – Shazia Bashir, Resident Department of Obstetrics and Gynecology, Maternity Hospital (tertiary health care setting), Government Medical College (GMC), Anantnag, Jammu and Kashmir

**Third Author** – Farhat Jabeen, Prof (Dr.) Farhat Jabeen Department of Obstetrics and Gynecology GMC Srinagar
Evaluation of a conflict in a learning environment: Does it always fetch a negative outcome?

Md. Harun-Or-Rashid

Additional District and Sessions Judge, Law and Justice Division, Ministry of Law, Justice and Parliamentary Affairs, Dhaka, Bangladesh.

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Abstract- Conflict is a disagreement between two individuals or groups in an environment where one party's goals and aspirations are incompatible with the other party's interests and aspirations to achieve their desired outcome. Conflicts permeate every sector of an institution or take place even in a learning environment regardless of class, position, age, race, caste, or gender. It is started by a person who is antagonistic to another person in an effort to achieve a goal that is in opposition to their core values and interests. Even though the premise of it suggests a negative outcome, it ultimately has either a positive or negative result. This paper evaluates each stage of an institutional conflict that began as an interpersonal conflict, turned into an external conflict, and was finally settled by exterior intervention followed by a constructive outcome. It also depicts the entire conflict cycle on a sketch map, using the observational approach to draw conclusions based on both primary and secondary data. This article provides some background information and stimulates some thought about the life sketch of a conflict occurred in an academic setting and its resolution mechanisms.

Index Terms- Conflict, escalation, stalemate, de-escalation, and resolution.

I. INTRODUCTION

Conflict is something we must deal with every day whether we are interacting, working, learning, volunteering, or participating in any other capacity in an institutional setting, even though we would like to avoid it. It can occur even in an educational environment, whether they are located locally or internationally, because it is undoubtedly a crucial aspect of human interactions. It may occur due to the difference of viewpoint, opinion, or perspective between two people or groups or among institutions represented by some or groups of people who remain opposing goals and aspirations, which an antagonist sparks to another to achieve a targeted goal. According to Pruitt and Kim (2003), a perceived divergence of interest, a belief that the parties’ current aspirations are incompatible, is considered as conflict, and when it happens in an educational environment, it is termed as academic conflict. This academic conflict may be various in nature and manifested in multifaceted ways depending upon the context or environment of the academic institution. Generally, an individual or group experiences both internal and external conflict while socializing, interacting, working, volunteering, and performing in academic institutional contexts. Internal conflict indicates the mental, emotional, or spiritual struggles a person that he/she faces internally like, Character versus Self. On the other hand, external conflict is the struggle of an individual or among/within groups that face(s) against an exterior force(s). Conflict can be intrapersonal, interpersonal, intragroup, or intergroup depending on its internal and external meaning. However, it is very typical for one story to contain both sorts of conflict. In reality, internal conflict occasionally causes external conflict, and vice versa. Conflict naturally results from differences in interest, belief, and perception; therefore, if it is not managed, it may be destructive. Only effective and efficient conflict management can transform a destructive conflict into a constructive one. Therefore, conflict management techniques, and occasionally third-party interventions, are crucial for managing the conflict constructively in a learning environment, particularly for determining which characters are intervening in what manner, and at what stage of escalation.

The primary objective of this study is to investigate how a conflict occurred in an educational setting, like the one outlined below, which began as interpersonal conflicts, progress to group conflicts that are exacerbated by additional competing factors, and eventually lead the parties seeking for an intervention by third party to resolve the conflict in a manner that advantages all parties. In addition to the idea of conflict and its stages, styles, and methods, this article also discusses conflict behavior, escalation, and resolution procedures, with a particular emphasis on institutional conflict. Using different conflict resolution approaches, a conflict can be addressed constructively or destructively depending on whether the parties involved work to improve society, settle disputes, or eventually deepen a group's sense of unity.

To evaluate the ensuing conflict and determine its underlying causes and means of resolution, this study poses the following important questions:

Who were the main characters or parties in the mentioned conflict? What was the parties underlying interest and aspiration? What was their goal and why did they want to achieve this goal?
What steps did the parties take to work toward achieving their goals? What triggered the parties to involve in dispute that was originated from a conflict? What were the other elements that prevent the parties’ to achieve their goal? Why did the antagonist or antagonistic force oppose the other party in conflict? How was the conflict resolved? Was there a clear winner from this conflict?

In addition to determining the answers to the questions stated above, this study also examines the following queries using synchronizations of the questions indicated above:

What is conflict and conflict management? What is the nature of the conflict? What is underlying interest and aspiration in a conflict? What are the common categories of conflict? What are the common sources of conflict? What are the strategies in conflict? Why people involve in conflict? How do parties respond to conflict? What modes do parties use to address conflict? What are the key issues that affecting the decision making in conflict? What are the dual models in conflict? How contentious model of conflicts works in escalation of conflict? What is constructive and destructive conflict? Why power is exercised and how it works in the process of conflict? What are the strategic distinctions between players with high and low power in a conflict? How trust works in conflict? When conflict stabilizes? What is stalemate? What are the reasons for stalemate and its effect? What motivates the parties involved to resolve the conflict? What are the common mechanisms of resolve settlement of a conflict occurred in a learning environment in a constructive way?

II. METHODOLOGY

The conflict in issue is addressed and evaluated in this article in a qualitative approach using primary and secondary data to achieve the article’s goal and to investigate the relevant questions. Primary data was gathered using the observational technique, with individuals, parties, political elite, and court as a mediator or intervener as the unit of observation. As a direct and participatory observation and longitudinal process, the observer kept track of the situation for two years, as well as the conflict’s resolution for six months. Additionally, the observer also took notes and recorded all that was witnessed. Since this is a fact, the identities of the parties to the conflict, the group of individuals who support them, and the names of relevant organizations were used under pseudonyms to protect individual privacy and to adhere to the ethical standards of this writing.

The secondary data sources include prior studies, discussion papers, books on conflict analysis and management, journals, the internet, e-journals, numerous tools and websites for conflict management, and conflict resolution-focused magazine articles. The data were gathered longitudinally in an unstructured setting.

III. THE FACTUAL OVERVIEW OF THE CONFLICT

It was around 20 years back when Rahim (pen name) was a student of class x, and his Secondary School Certificate (SSC) Examination was knocking at the door. At the time, Zahid (pen name), the Head Master (Head Teacher) of his school, retired, leaving the position vacant. As required by school policy, the School Managing Committee published an advertisement in national dailies seeking a Head Master to fill the position. The advertisement included every criteria needed for the position. All qualified Bangladeshi nationals were eligible to apply. His teacher, Mr. Karim (pen name), who also applied for the position of Head Master while serving as an Assistant Head Master, was one of the other applicants. The neighborhood where the school was located was Mr. Karim’s hometown. Additionally, he was the brother of a political elite in Bangladesh. He consequently always displayed greater influence than his competitors. Although an oral and written appointment examination was held on the scheduled day, Mr. Zabbar was chosen by the school managing committee after placing first in the examination. Mr. Karim was incurred when he saw the outcome and, as a result, he could no longer stand Mr. Zabbar, the recently appointed Head Master. Even then, conflicts occasionally sprang out between them over trivial matters, which upset the other faculty members and disrupted the school’s atmosphere. Almost all of the pupils had some awareness of this problem. In general, the newly appointed Head Master, Mr. Zabbar, was more well-liked and approachable among the faculty, staff, and students.

One day, Rahim was startled to hear a commotion in the headmaster’s office, and he quickly realized that Mr. Karim was berating Mr. Zabbar. In just a few minutes after the news traveled around the campus, all of the school’s personnel and kids gathered on the school field and started to feel nervous. After hearing such information, the second group of people—who were Mr. Zabbar’s supporters—entered the school and made an effort to denigrate Mr. Karim. Rahim and other faculty members at the school were aware of the situation’s deteriorating state and reported it to the police station. Soon after, police arrived at the school and quickly took charge of the situation. Police recorded the first information and filed a case. Rahim represented the students at the school at that time. The cops recorded his identity as a witness. Mr. Karim and his politically influential brother exerted pressure on Rahim to testify during the witness gathering phase of the continuing legal dispute between Mr. Zabbar and Mr. Karim. Though Rahim was in a fear if he would not give his testimony in favor of Mr. Karim, he might have to face some political harassment, but his mind/conscience did not give the consent to produce testimony against Mr. Zabbar. So, after consulting with his family members and considering that entire thing Rahim was determined not to give testimony in favor of Mr. Karim. When the date of producing the witness came, Rahim left his city and moved to the capital city, and returned after a few days. When Mr. Karim and his brother found him they showed their heated behave on him. During his SSC final exam, that political elite had created some uncomfortable situation for him, but nobody dare to say anything against that political elite, even the local executive officer: because the concerned political elite was the Chief executive of his local jurisdiction. Rahim obtained his Secondary School Certificate and was accepted into a college in the nation’s capital. When Rahim moved to the city to finish his higher secondary education, Mr. Karim forewarned him that he would be keeping an eye on Rahim’s performance there. Until the dispute was handled in a

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positive way with the help of the court's intervention, Mr. Karim even started to express his irritation and annoyance toward Rahim whenever Rahim encountered him or made eye contact with him in person.

To figure out the best possible responses to the aforementioned questions and to assess the fact that is mentioned earlier, this paper also congruently explores the following significant words and brief notes that are emphasized in the accompanying flowchart (Figure 1):¹

![Conflict and Conflict Management Model](image1)

**Figure 1**

Conflict and Conflict Management Model

The flowchart, designed above from left to right, outlined each stage of a conflict happened in an educational environment and its management by pointing out just its essential components. It portrayed how the underlying interests and aspirations between parties at some point clash and create interpersonal conflict, eventually leading to a group conflict due to external factors and finally coming to a settlement.

Like the mentioned conflict and conflict management model, the mentioned fact also embraces two parties: they are Mr. Karim and Mr. Zabbar. Their interpersonal conflict eventually turned as group conflict, which was finally resolved by the intervention of the court in a constructive way.

**IV. ANALYSIS OF THE CONFLICT**

Conflict analysis is a technique to plan, carry out, and assess the dynamics, participants, causes, effects, and resolution mechanisms of conflict between the parties, groups, society, and the state. In a similar fashion to how doctors examine patients, conflict analysts also do so. The conflict analysts assist the conflicting parties, groups, or states in resolving their conflicts by increasing their ability to comprehend how to promote changes in the conflicting parties by minimizing the negative effects of conflict or modifying the conflict to make some positive changes to ensure social justice. The following subheadings provide further explanation and evaluation of the stated conflicting fact:

i. **Conflict**

Regardless of the fact that social psychology considers conflict as one of the most significant areas of study (Katz & Management by Professor Richard C. Ruben, University of Missouri-Columbia School of Law, USA.

¹ Note: This flow-chart is prepared as per the draft-chart presented in class on April 18, 2019 in the course of Conflict and Conflict Analysis of the Conflict.
In the above-mentioned fact, Mr. Karim and Mr. Zabbar were the primary parties and rest of the faculties, students and other actors were the secondary and peripheral parties. In general, conflict involves two parties but others often get involved in creating persecution, victim and rescuers. When two people have an interaction and each influences the other and is affected by the other then they considered as actors or active party. Sometimes, a third party gets involved through exacerbating the situation creates a negative triangle and making matters worse also be termed as active party.

### iii. Conflict of interest and aspiration

A conflict, whether it may be the social or institutional, it requires a difference in the interests and goals of two parties in a particular circumstance, case, fact, or topic. When the objectives and priorities of two parties diverge, the situation is said to be conflicting, and the issue is said to be a conflict. In a conflict situation, both parties prefer to look for solutions to their problems rather than caviling or cutting off communication since their interests are at odds or they don't necessarily desire the same things. This incompatibility of aspiration and conflict of interest are the underlying reasons to involve in conflict by two individuals working together in an institution. Conflicts can start when goals are obstructed or when there is ambiguity over how to achieve that goal. Conflict also arises when a person or group pursues a goal that is seen as impeding the pursuit of a different party's goal/objective.

From the mentioned fact it shows that initially Mr. Karim had a latent intention to be the Head Master of the concern School and through participating in the job appointing examination his underlying intention was manifested as an aspiration to acquire the post. So, this was the combination of interest and aspiration of an individual to reach a goal or achieve of an objective with certain endeavor. On the other hand, Mr. Zabbar as an aspiring candidate for the same post he was possessed the similar interest and aspiration to achieve that objective through fulfilling certain requirements of appointment. Therefore, in a sense, it was a latent or interpersonal clash of interest and aspiration between Mr. Karim and Mr. Zabbar to attain their own objectives. Until it’s manifestation through certain action it cannot be considered as external conflict. So, from this notion conflict may be divided as internal and external conflict.

### iv. Perceived interest, aspiration and certain goal

In a conflict, the interest and aspiration of the parties are to be perceived, felt, manifest and have an aftermath affect. So, non-perceived interest and aspiration that is, the issues which occur are unaware by the parties’ cannot be termed as conflict. In terms of defining of a conflict, the emphasis is always given on the non-manageable disagreement of interests and aspirations of the parties (Onyesom & Emekw, 2015, p. 250). Therefore, interests indicate something that tends the parties to think and action, forming the core of many of their attitudes, goals and intentions. One the other hand, it can be considered as the parties perceptions or internal representation about what are they desire (Pruitt and Kim, 2003, p.15; Austin & Vancouver, 1996, p. 338). Interests have several dimensions like, tangible, intangible, specific and universal (Pruitt, 2003).
and Kim, 2003, p.16). Power, honor and recognition come within the purview of intangible category due its abstract nature (Pruitt and Kim, 2003, p.16). The indicated conflict is very much intangible in nature because it was initially started to acquire for a post or designation or rank and that ultimately triggered as a groups conflict amalgamation of other power related issue. But, the aspiration of the parties’ must be understood as the manifestation of the underlying interests. On the other hand, it can be said as the mental representations of the parties, or goal or objective which the parties strived for or perceived to be achieved (Pruitt and Kim, 2003, p.16). In the mentioned case the goal of both Mr. Karim and Mr. Zabbar were to achieve the post of a Head Master in anyway, so they had a strong and perceived aspiration. So, conflict appears when a party experiences his interest and goal or aspiration is incompatible with other (Pruitt and Kim, 2003, p.16).

v. Internal and external conflict

One of life’s most difficult facets is dealing with internal or interpersonal conflicts. Even while everyone would prefer avoid it, it exists everywhere, has a cause and effect (Coser, 1956), and may either be destructive or constructive. Knowing its underlying causes increases the likelihood of finding integrative solutions to problems, which might allow all parties to achieve their goals (Fisher, Ury, & Patton, 1991; Rahim, 2001). It is the struggle a person goes through inside that affects their thoughts, emotions, interest, and aspirations to achieve his/her targeted goal. Likewise, the interpersonal issues which affect the actions, motivations and interactions of an individual with other may be termed as interpersonal conflict. Generally, the conflict management expert does not consider the latent/internal conflict as a conflict, because sometimes it may not be manifested through further actions.

A conflict on an interpersonal scale, may be provoked by some of the external actors. It may be a political, economic, or social nature (Sandole, 1998). In general, a conflict between an individual or group of individuals and any other external force, such as a villain, or the government, is referred to as external conflict. External conflict can be intergroup, intragroup, and inter-organizational conflict (Thakore, 2013). Intergroup conflict may be very difficult since it often involves people from different groups or institutions who are either emotionally or substantively driven to struggle. According to the fact given, Mr. Karim initially went through internal conflict because of his ambition for fame and power, which ultimately led him to get involved in an external conflict or intergroup conflict.

vi. Reasons for arising conflict

Conflicts typically have the same tone and underlying causes whether they occur at a place of worship or a school. Experts have been disputing for a long period of time whether conflict is a result of sociopolitical and economic causes or an innate human characteristic (Collier, 1975). Some scholars claim that human biology is one of the main reasons on what causes conflict. Such a strategy is known as individual characteristic theory, according to Schellernberg (1996), and it concentrates on the person performing the act rather than its surroundings. McCauley (1990) supports this assertion and mentioned that people engage in violent conflict because it is hereditary. On the other hand, anthropologists have successfully used these ethno-graphic studies to disprove and expose the insufficiency of the biologically based explanation of the causes of conflict.

However, Conflict may arise in so many reasons like, scarcity of resources (Pruitt and Kim, 2003, p.21), rapidly changing of aspiration due to its expansion (Pruitt and Kim, 2003, p.21), zero-sum thinking or fixed pie assumption (Pruitt and Kim, 2003, p.22), ambiguity about nature of power (Pruitt and Kim, 2003, p.22), invidious comparison (Pruitt and Kim, 2003, p.23), and status inconsistency (Pruitt and Kim, 2003, p.24), distrust (Pruitt and Kim, 2003, p.25), lack of normative consensus (Pruitt and Kim, 2003, p.26), dilemma of security (Pruitt and Kim, 2003, p.25), issues of social identity (Pruitt and Kim, 2003, p.28-30), social structure (Ruben, 2019, January 29), social aggression (Ruben, 2019, January 29), needs (Ruben, 2019, January 29), struggle over resource (Ruben, 2019, January 29), craving for long term happiness (Ruben, 2019, January 29), biological reason (Schellenberg, 1996, p. 43), and group mobilization (Pruitt and Kim, 2003, p.32). People’s different styles of thinking, perceptions, perspectives, understanding, principles, values, beliefs, and slogans are also the reasons of disagreement (De Bono, 1985). Sometimes, high concern about self-esteem and concerned with fear, force, fairness or funds are also the reasons arising conflict between the parties (De Bono, 1985). In the institutional level sometimes high stress workplaces, ambiguous roles and responsibilities, situations with several bosses, and a predominance of cutting-edge technology (Kirchoff and Adams (1982), also creates conflicting environment if is not managed properly. According to Filley (1975), a number of variables, such as communication barriers, conflicts of interest, incompatibilities in goals and jurisdiction, reliance on one party by a group or an individual, organizational differences, affiliations and specialties of the parties, behavior regulation, and unresolved prior disputes, may lead to conflict situations in an institution. It is typical for members of a team or institution to experience stressful conditions as a result of confusion and pressure, which can sometimes result in conflicting scenarios (Thakore, 2013).

In the instant case, both Mr. Karim and Mr. Zabbar have only one goal to achieve the post of a Head Master. So, there was limited resource available and the aspiration to achieve that resource/post rapidly changed their perceptions and they felt it just like a zero-sum game. Moreover, as an invidious comparison Mr. Karim thought himself more knowledgeable/qualified and more powerful than Mr. Zabbar, which ultimately triggers the internal conflict to the external conflict. So, among the mentioned reasons, some are internal and some are external reasons which in fact trigger someone to involve in the conflict. Internal reasons may be arise from emotion, ego and other psychological reasons. On the other hand, power, identity, security and group mobilization are the external reasons of a conflict. Basically, external conflict can be motivated by survival, by pride, love, morality or duty, or number of other factors. This sort of external conflict pits one individual against another, albeit the origin of the conflict can vary. There are times when both parties want the same thing, sometimes both want different things, but one or both hinder the other’s success, sometimes one side wants to destroy or hinder.
the other, sometimes one side wants to harm, hate the other out of malice or greed, and sometimes one party wants what another party has. So, from this perspective external conflict may be Individual versus Individual, Individual versus Society, Individual/group of people versus Nature, Individual/group versus Machine, and Individual/group versus Fate/Supernatural conflict. In the depicted fact it shows that initially it was just like an interpersonal conflict and that finally triggers into as groups conflict.

vii. Conflict and its transformation as dispute

Conflicts in today's environment can take many different shapes and cover a wide spectrum of viewpoints. These "systemic" features of conflict are the overt or obvious manifestations of the aggrieved group's dissatisfaction with the other group(s) and are intended to hurt or degrade the other group(s). The ability of the parties to settle their disagreements on their own, without the external involvement or outside support, is tough and complex when this form of conflict occurs on a bigger scale. Most often, a larger-scale conflict manifests as a dispute that needs the intervention of a third party or outside help to be resolved. Though conflict and dispute runs together, but all conflict is not the dispute. Generally, a dispute is the mature formation of a conflict. According to Costantino and Merchant (1996), “conflict is a fundamental disagreement between two parties, whereas, a dispute is one the possible outcome of a conflict.” A dispute is a short term disagreement that might lead to an agreement between the disputants; it involves issues that are negotiable (Keator, 2011; Burton, 1990). Contrarily, conflict may last a long time and involves core issues that are viewed as “non-negotiable.” (Burton, 1990). The primary idea is that a dispute can quickly escalate into a conflict if left unresolved and unaddressed. However, without assistance, conflicts rarely turn into dispute (Keator, 2011; Burton, 1990). In general conflict does not escalate until parties’ take any further action regarding escalation. This escalation process is also called as transformation of conflict to a dispute, which occurs through process of naming, blaming and claiming (Felstiner, Abel & Sarat, 1980). These three process in accordingly help to transform the conflict to a dispute. In the illustrated dispute, Mr. Karim pointed his finger to Mr. Zabbar and indicated that if Mr. Zabbar would not apply for the post he would get the job. So, Mr. Karim’s naming, blaming and claiming approach in fact, triggers the conflict as a dispute.

viii. Lens of conflict

One of the most fundamental inborn conflicts that people encounter is between their own concerns and those of others. People frequently focus on themselves and seek out their own interests first. However, conflict arises when there is another person out there who shares the same aspirations and is ready to employ any method necessary to achieve those goals. Short-term self-interest may push us to act selfishly and take advantage of others' goodwill without giving something in return (Jhangiani & Stangor, 2022). Nevertheless, it can be detrimental in the long run due to its inherent conflict nature. The self-concern model includes the naming, blaming, and claiming issues, which are also the contentious behavior characterized as one of the Lens of Conflict. On the other hand, having knowledge of and awareness of how others perceive you (other-concern) is another lens of conflict that aids in bridging the understanding gap and encouraging a constructive resolution. In fact, the lens of conflict is a conflict management tool that is based on self-perceived personality and how a person makes out himself/herself to have behaved (lens of self) which may differ from how others perceived the behavior (lens of other). Through this lens of conflict a party may identify two tangible conflicts they were tangled in, and then open the door to perceive about what they worked, belief and thought during the conflict and about the aftermats of each conflict.

In the aforementioned conflict, which started as an interpersonal conflict but later turned into a group conflict as a result of putting a higher focus on self-interested factors in order to achieve a goal.

ix. Styles of conflict

For resolving the aforementioned conflict as perceived by the parties through applying their lens of conflict, parties’ may use various styles that are terms as styles of conflict. According to Pruitt Dean & Kim (2003, p.42), “conflict style is the way a person most commonly deals with conflict.” These strategies are categorized by the behavior of the parties like, contending, yielding, problem solving, enacting and withdrawing (Pruitt and Kim, 2003, p.5; Thomas and Kilmann, 1974). Although there are many ways to resolve conflicts, Mary Follett was the first to make an effort to do so when she proposed dominance, compromise, and integration as the three main strategies in the 1940s (Chinyere, 2018). This effort took full shape when she later added avoidance and suppression as conflict management styles, which caused a paradigm shift in the field of human resource management (Chinyere, 2018). Other researchers have developed styles ranging from two to eight (Chinyere, 2018), suggesting that no single style is sufficient to resolve a conflict because it depends on the viewpoint of the parties involved as well as the circumstances.

Given this fact, Thomas and Kilmann's (1974) model of conflict management styles and Pruitt and Robin's (1986) conflict management model are both used to further the explanation of how conflict styles can be used and when they should be used. So, the following diagram can be used to better comprehend the conflict management styles as well as the dual-concern model:
The mentioned model has two components, assertiveness (self-concern) and empathy (concern of others). Empathy is designated on the y-axis, whereas assertiveness is on the x-axis. The model is used to produce five distinct conflict management styles that people might employ to handle issues that they may encounter on a regular basis. The model portrays five styles for resolving conflicts: competing, avoiding, compromising, accommodating, and cooperating. The x-axis depicts competing and avoiding styles, which indicate assertiveness, while the y-axis depicts accommodating and collaborating styles, which indicate empathy. Compromises can be formed where there is a balance between being cooperative and assertive.

As per the model, low concern for oneself and others characterizes the avoidance style, whereas high self- and low other-concern characterizes the accommodating style, high levels of self- and low levels of other-concern characterize the forcing style, and a compromising style indicates concern for both, respectively. These conflict resolution styles indicate a person's degree of concern for self and for the others and the level of their satisfaction.

According to the mentioned model, if parties’ use a competing style, then they might force the others to accept ‘their’ solution, but this acceptance may be accompanied by fear and resentment (Pruitt and Kim, 2003, p.7). If they accommodate, the relationship may proceed smoothly, but they may build up frustrations that their needs are going unmet. If they compromise, they may feel comfort about the outcome, but still harbor resentments in the future. If they collaborate, they may not gain a better solution than a compromise might have yielded, but they are more likely to feel better about their chances for future understanding and goodwill. And if they avoid discussing the conflict at all, both parties may remain clueless about the real underlying issues and concerns, only to be dealing with them in the future.

In the illustrated conflicting parties’ initially used the contentious techniques and finally they applied the problem solving approach through a third party neutral like, court proceedings. The mentioned conflict was very much related with the strategies of contending, where both parties’ adopted the contentious techniques (Pruitt and Kim, 2003, pp. 63-84) through applying their active strategies like, threat, tit for tat, and engaging in a violent activities (both instrumental and in group violence) (Pruitt and Kim, 2003, pp.79-80) in a relatively consistent and coherent manner that ultimately lead them to reach a solution.

x. **Constructive and destructive conflict**

It is clear that a conflict has had negative outcomes when both parties believe they have lost as a result of the conflict. Similar to this, an educational institutional conflict or conflict occurs in a learning environment has positive outcomes if everyone involved is happy with their outcomes and feels like they have benefited from the conflict. This is what Morton (1969) refers to as "the greatest good for the greatest number" in a single sentence. It does not necessarily mean that conflict is a negative thing. It is far from being necessarily dysfunctional. Moreover, a certain degree of conflict is essential for group formation and persistence of group life (Coser, 1956, p.31). Sometimes, it facilitates the reconciliation of peoples’ legitimate interests (Pruitt and Kim, 2003, p.10), discourages premature group decision making (Pruitt and Kim, 2003, p.11), and a sine qua non of reflection and ingenuity (Dewey, 1930, p.300). Generally,
differences in opinion over organizational tasks, rules, and other issues commonly lead to conflicts that have a constructive outcome as opposed to conflicts that are typically instigated by members and result in verbal abuse, racial tension, and sexual harassment (Chinyere, 2018, p. 25). Usually, avoiding, yielding and problem-solving strategies promote the parties to a constructive outcome and where both the parties’ become happy for settlement of dispute through consensus mechanism. On the other hand, contending style of conflict, parties usually achieve the negative outcome.

The aforesaid conflict though initially started as a contending style, nonetheless, it facilitated the substantive dialogue between Mr. Karim and Mr. Zabbar through adopting the court-mediation process, it fostered mutual understanding, and finally it reached to an integrative solution through resolution of dispute by the mechanism of court-mediation. So, it can be said that it was a constructive conflict, rather than the very opposite nature of destructive conflict.

xi. Escalation of conflict

Escalation of conflict indicates the intensification of conflicting nature between individuals or groups in interpersonnal relationships, or it may refer to the acceleration of hostilities in a large societal context. In another sense it can be said that it is a situation when conflict heightens in a grade to which one party dehumanizes the other. Eckert (2003) pointed out that every conflict has the potential to escalate, from the process of escalating interpersonal disagreements to the inhumane treatment of relationship between groups or states to the point when violence, terrorism, and war are engaged. As an idiosyncratic features conflict may be escalated due to the competition, exasperation, impulsion and for retaliatory mindset of the parties (Pruitt and Kim, 2003, p. 129). Moreover, tendency toward strong need for social approval, feel guilty about aggression, high empathy with more reflectiveness may be the causes of escalation of conflict. In addition, strong group bondage or association, limiting norms of the communities, cultural differences, age, gender and divergence of power play a significant role in terms of escalation of conflict. Among the mentioned features of escalation power imbalance is the key factor that helps the strong party or group to exercise dominance, control, and autonomy over the weaker party or group through using his/their advanced information, connectivity, role and strength (Pruitt and Kim, 2003, pp.144-146). This power may be the personal power and relationship power, which accrues from the deep rooted structure of the society like, role, history and hierarchy and interdependence of group goal. The party with high power believes in superior competence than the individual with low power and tries to marginalize him through using heavy techniques of under-estimation. On the other hand, the low power holders through using the techniques of cohesion, organization and motivation try to mitigate the power imbalance. In addition, environmental conditions (Pruitt and Kim, 2003, pp. 126-128), idiosyncratic features (Pruitt and Kim, 2003, pp. 128-129) of the parties, social bond (Pruitt and Kim, 2003, p. 134) and relation with the larger communities (Pruitt and Kim, 2003, p. 136) play a significant role in terms of escalation of conflict. In terms of escalation of conflict, the contender-defender model (where one side behaves as a defender and the other as a contender), the contentious model (where both parties are interested in struggling to attain the goal), and the stereotyping and mirror imaging model (parties project images onto others, and this creates a stereotype of the other) are commonly seen in the area of conflict management. So, from the mentioned viewpoints, conflict escalation can be demarcated as an increase in a conflict’s severity in relation to the degree that is seen and the methods that are employed (Richard, 2017).

In the mentioned fact, Mr. Karim’s insulting attitude to Mr. Zabbar created a contentious atmosphere, and then the defensive attitude of Mr. Zabbar created it a spiral one, that is as a destructive conflict spiral model. As a cycle of escalation the associated group of Mr. Karim attacked on Mr. Zabbar, which created a huge emotional change regarding Mr. Zabbar image. Thereafter the associated group of Mr. Zabbar rushing to the spot escalated the conflict more rapidly. So, this spiral of conflict was both the combination of defensive and retaliatory, where each party punished the other for actions it found aversive. According to Dean G. Pruitt and Sung Hee Kim (2003, pp.119-120), “a cycle of escalation might, for example, start with Party’s receipt of what it considers to be an insult from other. If this makes Party angry and fearful about its image of adequacy, these emotional changes could produce a return result from Party. This might then produce similar emotional changes in other, encouraging still another insult. This cycle would then be complete, but it could be followed by further cycles, causing the conflict to become increasingly escalated.”

From the above mentioned observation of Dean G. Pruitt and Sung Hee Kim, it shows that the current factual overview also portrays the similar issues of conflict spiral (combination of contender-defender model, conflict spiral model and structural change model) with the involvement of other emotional issues, goals and responses of each party’s associated group of people. Moreover, as per the factual overview, when the two groups (Mr. Karim’s group and Mr. Zabbar’s group) took their preparation to attack one another, then the police rushed to the spot and arrest some of them and lodged a criminal case. As a representative of the school and informer of the incident Rahim was one of the witnesses of the mentioned case. In fact, this was the peak point of the illustrated conflict, and after that the mentioned conflict persisted for a long time as a plateau, and then in one point it reached as a stalemate.

xii. Stalemate of conflict

Stalemate is a condition when parties understand they are not willing to continue the conflict, or further endeavor to success through escalation are unfeasible (Pruitt and Kim, 2003, p.172) or imprudent (Pruitt and Kim, 2003, p.172).This situation may be termed as the ripeness of conflict (Marieke, 1994). It may be categorized as perceived and non-perceived. As a mechanism of settlement negotiation and mediation usually developed from perceived stalemate (Pruitt and Kim, 2003, pp.129-146). This type of stalemate occurs when the tactics of the parties are failed, or exhausted due to lack of necessary resources that required for using the tactics or loss of support from the associated members.
or group, or high cost and risk to continue (Pruitt and Kim, 2003, p. 188).

As seen by the provided fact, both parties to the conflict eventually became weary and believed that continuing with the litigation was not in their best interests as academics and should be put to an end. This impasse in the conflict is referred to as a stalemate since both sides are waiting for a favorable or prestigious resolution. However, this stalemate situation can occasionally lead to escalating violence due to outside interference and instigation.

**xiii. De-escalation conflict**

De-escalation periods saw the deployment of less violent force than even "normal" times when the sides were allies (Mitchell, 1990). The good behaviors are amplified at this stage to make the issue easier to resolve. This viewpoint holds that two parties in a conflict scenario can collaborate or compete to resolve the disagreement by altering either their own behaviors or how they view the actions of the other party (Dunaetz, 2010). After passing few years of litigious condition, both Mr. Karim and Mr. Zabbar perceived that the case tarnished their image in the school, and that would not ultimately carry any fruitful outcome due to cost and other social effect. This tendency may be termed as de-escalation of conflict (Pruitt & Kim, 2003, pp. 126-128).

Generally speaking, de-escalation signifies the behavior of the parties involved in conflict which is intended to escape from the further escalations of conflicts. It is one of the meaningful turning points of conflict resolution.

In the given fact, both Mr. Karim and Mr. Zabbar were mutually hurt from the incidence, so at this point, as a theory of ripeness (Pruitt & Kim, 2003, p.188) they were pushed by the judge to solve the case through court mediation process.

**xiv. Outcome and the resolution of conflict**

The styles a conflict is handled determines its outcome. (Deutsch, 1949). Each conflict produces a specific set of outcomes and depending on the method used to solve the problem, these outcomes change. Whitfield (1994) pointed out that depending on the management style used by an institution, the outcome of a conflict can either be detrimental or beneficial. From this point of view, conflict does not fetch a bad thing always that has to be avoided. Instead, it should be viewed and handled positively to encourage creativity, innovation, better performance, and improved interpersonal relationships by reducing its negative effects within an institution. (Rahim, 2002).

Every institution, regardless of size, complexity, or simplicity, has a variety of systems or processes for handling conflicts and resolving disputes. Along with tactics and ways for resolving the dispute, it also identifies approaches and strategies for managing the conflict. Dealing with conflict and managing conflict are both parts of conflict resolution. Therefore, conflict management and negotiation are two separate components of conflict resolution that must be combined to produce favorable results. When hostile attitudes have diminished and conflicting or destructive behavior has been curbed, the conflict management or settlement, takes place. The conflict's root issues must to be addressed, though. However, there is still room to address the conflict's underlying issues. Following a reduction in the level of conflict, the next stage is to employ negotiation or problemsolving techniques to reach a solution that is acceptable to both sides. At this stage, the interests of the parties involved in the conflict are changed or modified in order to resolve the issue. Finally, the conflict management processes, as well as third-party involvement such as a judge, arbitrator, or mediator may be employed to resolve a conflict or dispute finally. Negotiation is another alternative process where either integrative (win-win) or distributive (win-loss) mechanism is used to resolve the conflict or dispute.

In the aforementioned conflict, as a theory of contractual intervention (Pruitt & Kim, 2003, p.227) used by a professional mediator or judge, Mr. Karim and Mr. Zabbar eventually came to a constructive resolution of their disagreement after going through the mediation process and withdrew their lawsuit.

**V. Conclusion**

Conflict can occur at any point in an institutional or a learning environment, making conflict management crucial to the growth of an institution, preserving peace and security, and ensuring equal access to institutional justice. Even though conflict by definition implies something negative outcome, the particular conflict in question was settled in a constructive way. Generally, constructive behaviors like mutual understanding, integrative, and cooperative relationships will be very beneficial; yet, this is the most difficult problem because the parties' interests and aspirations are so different. Therefore, in terms of decision-making and conflict resolution, emphasis should be placed on approaches that enable constructive conflict management, such as civil discourse, trust building, and constructive controversy among/within the groups, and disregard approaches like autistic hostility, like autistic hostility (Pruitt & Kim, 2003, p.160), group or community polarization (Pruitt & Kim, 2003, pp. 163-164), group think syndrome (Pruitt & Kim, 2003, p.113), overlapping bonds (Pruitt & Kim, 2003, p.139), stereotype behavior (Schaller & Neuberg, 2008; Bar-Tal & Teichman, 2005, p.3), dehumanization (Pruitt and Kim, 2003, p.111) and de-individuation (Pruitt and Kim, 2003, p. 111). Moreover, to facilitate social interaction between and among the parties to a conflict, conflict analysis and management are vital (Pruitt & Kim, 2003, p.227). In reality, both contractual and emergent intervention (Conlon & Meyer, 2004; Pruitt & Kim, 2003, p.227) are crucial for addressing the conflict constructively, especially for identifying the parties’ roles and levels of intervention throughout the phase of escalation. In light of the fact that the constructive or problem-solving approach is the best way to resolve conflict in academic settings, this study also recommends further research to identify all underlying causes of conflict of a similar nature in academic settings in order to improve the edifying qualities of an educational institution.

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Note: 1

[46] This flow-chart is prepared as per the draft-chart presented in class on April 18, 2019 in the course of Conflict and Conflict Management by Professor Richard C. Ruben, University of Missouri-Columbia School of Law, USA.

Authors

First Author – Md. Harun-Or-Rashid, Additional District and Sessions Judge, Law and Justice Division, Ministry of Law, Justice and Parliamentary Affairs, Dhaka, Bangladesh. Cell Phone+8801913946594, Email: lawlifejustice123@gmail.com
Tax Compliance Is Influenced By Provision Of Quality Services And Good Governance By The Government: Lessons From Tanzania

Fadhili Ephraim Maseko, Ibrahim E. Sawe

Abstract - The motive of this paper was to establish the existing relationship between the perceived factors that impact tax compliance in Tanzania using SMES at Babati town council Manyara, as a case study, and develop the best ways to promote high tax compliance level in our economy. The study used a mixed approach and survey design, where 100 respondents were chosen to take part using random and purposeful sampling methods. The study revealed, that the provision of quality services and good governance had positive and significant influence on tax compliance in Tanzania, with an adjusted R2 = 86.1%. The study recommended to Tanzania Revenue Authority to offer high quality services and good governance to the taxpayers, and the government should continue to invest in superior social services such as health services, education services, and infrastructure. Services should base on scientific and needs of society.

Index Terms - Tax, Tax compliance, good governance, service quality

I. INTRODUCTION

The concept of tax compliance predates taxes themselves, and it will continue to be a major issue for as long as taxes are levied. Compliance with tax laws means voluntarily and totally paying any taxes that are owed (Kirchler, 2007). There has been a lot of talk about the issues that can affect tax compliance. There are two main strategies for dealing with the issue of compliance that have been identified in the academic literature. The first is based on the study of economic rationality and was created by economists. The second examines behavior in a broader context, drawing on ideas and studies from fields like psychology and sociology. Compliance with tax laws is a major area of study for economic psychologists (Webbey Paul, 2004). There isn't a tone of literature on this topic, but he summarises some strong empirical findings that keep popping up in studies of both individuals and businesses. Sometimes economic and behavioural theories are seen as rivals. The challenge is figuring out how the two ways may be utilised to complement one another. Nevertheless, each methodology can be useful for understanding tax compliance (James, Simon, Hassel dine, John, White, Peggy and Toumi, Marika, 2001). To finance their budgets, nations struggle to increase the effectiveness of tax revenue collection. Many revenue authorities around the world, particularly in developed countries, are paying close attention to the challenge that tax authorities are experiencing in providing correct ways for taxpayers to behave toward the tax system. What has been done to examine taxpayer behavior toward the tax system in emerging nations, however, is in dispute (Lumumba et al., 2010).

Theoretically, tax compliance can be characterised by taking into account three different types of compliance, such as payment compliance, filing compliance, and reporting compliance, according to Brown and Mazur (2003). When examining definitions of tax compliance, the Organization for Economic Cooperation and Development encourages categorised compliance (OECD, 2001). These categories are administrative compliance and technical compliance. Administrative compliance refers to following administrative rules for lodging and paying, also known as reporting compliance, procedural compliance, or regulatory compliance. Technical compliance refers to following technical requirements of the tax laws in calculating taxes or provisions of the tax laws in paying the share of the tax controlling taxpayers' noncompliance behaviour (James & Ally, 2004).

Tax compliance was described by Alm (1991) as the act of reporting all income and paying all taxes in accordance with all applicable laws, rules, and court orders. Another meaning of tax compliance is the act of completing out the income tax form, accurately disclosing all taxable income, and paying all due taxes within the allotted time frame without needing to await follow-up actions from the authority (Singh, 2003). According to Roth et al. (1989), taxpayers must complete the Income Tax Form with all necessary information within the allotted time frame, and the form must accurately report the taxpayer's tax burden in compliance with the requirements of applicable laws, rules, and court rulings. People who purposefully or unintentionally violate tax laws are regarded to have broken the law. Theoretically, according to the perspectives of taxpayers and tax collectors, tax compliance entails abiding by the tax rules, which vary from one nation to another.

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According to Cobham (2005), tax compliance is a problem for many countries as measured by tax to GDP ratio, even though it has been improving for many countries, the goal of tax administration is to foster voluntary tax compliance (Silvani, 1992), which will reduce the tax gap (difference between taxes paid and owed for all taxes and all taxpayers), also known as the "compliance gap," and other related issues. For instance, it accounts for one-third of GDP in wealthy nations, 17% of GDP in Latin America and the Caribbean, and less than 15% of GDP in low-income nations (in Sub-Saharan Africa) (the recommended rate). It continues to be a major obstacle for developing nations. Radical tax reforms have been encouraged as a result in nations like Bolivia, Colombia and Uruguay. Spain and Jamaica have had remarkable successes (Bird & De Jantscher, 1992). As stated by several academics, Jackson and Milliron (1986) identified 14 primary elements that have affected tax compliance. These elements include age, gender, education, income, occupation or status, peer or other taxpayer influence, ethics, legal sanction, complexity, relationship with the taxing authority (IRS), sources of income, perception of the fairness of the tax system, likelihood of being audited, and tax rate are some of the factors that may be taken into account. Researchers have identified a number of variables that affect tax compliance, including tax agents, demographics, income, and compliance costs (Mohani, 2003). Besides moral or ethical considerations (Singh, 2003; Kasipillai et al., 2003). Other researches (Sour, 2002; Keller, 1997; Trivedi, 1997; Hamm, 1995; Chang et al., 1987) have identified enforcement element elements (such as penalties, audits, and tax rates) as having a significant impact on tax compliance behaviour. The tax compliance behaviours of a taxpayer typically diverge from those predicted by economic models. Taxpayers are significantly influenced by one another. In addition, the frequency and quality of audits will affect a taxpayer's tax compliance behaviour (Trivedi, 1997). The problem of tax compliance is extremely severe in other nations. In April 1995, 8.3 percent of the 117 million Income Tax Returns filed in the United States contained inaccurate tax information. In addition, 7 million individuals, or 5.6%, did not file a tax return (Hamm, 1995). Taxation is an important problem for management and directors since it affects a substantial portion of a company's profit (Ojeka, S. A.) (2011). Consequently, numerous businesses will engage in tax planning to reduce their tax obligations (Jabbar, H. A. & Pope, J., 2009). The tax code offers a foundation for SMBS to engage in tax planning activities. For instance, managers will utilise government-provided incentives to lower their tax liability. A greater tax burden will diminish the return on investment for shareholders as the company's earnings decreases. Managers must undertake good tax planning in order to minimize the tax burden and increase the profit (O'Regan, N., Sims, M., & Ghobadian, A., 2005). Corporate governance can boost tax compliance by increasing the senior management's openness and accountability to the company and its stakeholders. A high level of transparency will make it impossible for managers to misappropriate funds. Consequently, a high level of tax compliance can be attained. The tax compliance model is based on past research on publicly traded companies (Samsuddin, M. A., Rohaya, M.N., Mastuki, N. A. & Ambali, A. R. 2011). The primary purpose of the present study is to examine if corporate governance influences tax compliance in small and medium-sized enterprises. Utilizing characteristics from prior studies, such as director compensation, board size, firm size, capital intensity, leverage, and return on assets, the model is constructed. In addition, two dummy variables, dummy tax incentives and dummy years, were added in this model to account for changes in the tax systems pertaining to SMEs. In the current tax climate, directors are asked to assume responsibility for tax management (Jabbar, H. A., and Pope, J. (2009). Previously, directors only participated in tax matters if tax evasion was implicated. Nonetheless, they can no longer pass over all to tax agents alone. The board of directors must guarantee that the company complies with its tax duties and can adapt to ever-changing tax laws and policies. The tax paid by the SMBS is a reflection of their tax preparation techniques and actions. This study will measure tax compliance based on the amount of tax paid. This analysis utilises two corporate governance components: board size and director compensation.

The significance of this study is shown in its examination of the function of boards of directors in boosting tax compliance among SMBS. This study will provide a deeper knowledge of how corporate governance might improve tax compliance in SME. Noncompliance will increase as tax revenue increases. To finance development and infrastructure initiatives for the benefit of the citizenry, the government relies largely on tax income [23]. Therefore, noncompliance will have negative effects not only on the growth of the private sector and the government's projects and activities, but also on the citizenry. Numerous factors lead to noncompliance. For instance, the complexity of tax rules has increased the likelihood of tax evasion (Jabbar, H. A. & Pope, J., 2009). In the perspective of the law, tax avoidance is permissible, but aggressive tax avoidance may be illegal or of uncertain legality and lead to noncompliance with tax laws (Ojeka, S. A. (2011), Cullis, J., Jones, P., Savoia, A., 2012). The tax issue should be managed with corporate governance (Ojeka, S. A., & Sartori, N., 2011). (2009).

Corporate governance urges companies to be open in order to avoid engaging in tax-aggressive behaviours that may result in noncompliance. In addition, corporate governance emphasises the role and obligations of the board in overseeing the activities of the senior management and ensuring proper corporate governance [25]. The value of corporate governance has been demonstrated, notably following the failure of major corporations such as Enron, WorldCom, and Ahold. Corporate governance must be practiced and become vital to the improvement of the business environment. In reality, boards must recognise the importance of their participation in a company's tax strategies and no longer delegate all tax matters to tax agents. Tax concerns must be handled with care because they might have lasting effects on a company’s performance. Therefore, risks of noncompliance can be decreased if the company has solid corporate governance and the boards' awareness is raised. Domestic revenue mobilisation is critical for developing countries to meet the UN's Sustainable Development Goals (SDGs). Tax evasion, on the other hand, is a big issue in many countries. According to research, laws and regulations do not adequately address tax evasion, and there is a need for ways that target 'voluntary compliance.' Voluntary compliance is anticipated to be especially essential in nations with little enforcement capacity. The planned study's ultimate goal is to build knowledge and research capability to meet the societal challenge of increasing domestic revenue in mainland Tanzania and
Zanzibar. We concentrate on businesses, which have gotten little attention in research on voluntary compliance while accounting for the majority of tax revenue in most developing nations. We study two potentially crucial elements for voluntary compliance: I norms influencing willingness and ability to pay tax, and (ii) trust in tax administration. Personal and social norms for both official and ‘informal’ taxes (e.g., payments to community and kin) are investigated, as well as how these norms interact. The research combines qualitative interviews, taxpayer surveys, administrative tax data, and two field experiments to improve societal norms for compliance and trust in tax administration.

In many African nations, the states’ reliance on residents for revenue poses a significant barrier to transparent and responsive government. Tanzania has an extremely limited tax base, taxation accounts for only 12% of the GDP. In March 2006, over 70% of domestic taxes were paid by 286 major taxpayers, primarily medium and large formal sector enterprises. 1 Foreign aid and the natural resource sector provide the majority of state revenues. From a citizen’s perspective, a state that is nearly financially independent from regular citizen taxpayers is strong, but characterised by waste, incompetence, and corruption. 2 Thus, political processes can occur with minimal negotiating and policy concessions from minorities and their policy preferences. This "negative reciprocity" may also result in tax evasion and avoidance, as well as a hostile relationship between citizens and governments. If the impoverished majority possessed control over some key resources, they would have stronger counter-veiling ability vis-à-vis the state. Such counter-veiling authority would empower the citizens to negotiate more effectively with state representatives. The conclusion of such a political process would result in more citizen-friendly state policies. Changing the state’s bargaining position vis-à-vis its population involves altering the nature of political processes and the consequent political balance. Since SMEs make up the majority of potential taxpayers in many nations, their compliance rates have a direct impact on the government’s ability to collect taxes. For instance, small businesses in Tanzania are those with five to forty-nine employees or a capital investment of five to two hundred million Tanzanian Shillings. When addressing the growth of SMEs, it means that SMEs must be able to play their crucial role in both social and economic transformation. Medium firms employ between 50 and 99 people, or with a capital investment between Tshs 200 million and Tshs 800 (SME policy, 2002). Their responsibilities include working to reduce poverty, mobilising domestic savings for investment, providing jobs for citizens, and paying their fair share of taxes to the government, increasing the GDP of the nation (Smatrakalev, 2006). As a result, encouraging SMEs to voluntarily comply with tax laws is crucial for the country’s economic development.

Due to Tanzania’s long history of taxing, many individuals and businesses feel no remorse about underpaying their taxes (Maliyamkonw et al, 2009). According to international standards, which recommend collecting more than 30% of GDP, the nation only collects an amount equivalent to about 18% of its GDP (Ministry of Finance 2012/2015). Even taxation experts find it difficult to comply with all laws and regulations, which is primarily because of the amount of time it takes to complete each step. For instance, according to Schneppe (2012), an American taxpayer spends an average of 23 hours filing their tax return. Tanzanians must take more time to complete this than Americans do. Due to the complexity of completing returns, the majority of taxpayers must enlist the help of specialists. The problem is considerably worse in African nations, where there is a higher incidence of illiteracy than in the USA and Europe. As a result, tax return filing procedures are time-consuming tasks in Africa, notably Tanzania, and are significantly impacted by several factors such as businessperson illiteracy and subpar service from tax authorities (Mahangila, 2017). This makes SMEs less likely to voluntarily file taxes. Tax evasion reduces tax revenue, which has profound implications on the government and the population at large. However, the issue of tax evasion and tax avoidance affects Tanzania, as well as the majority of African nations (IMF, 2011). In order for the government to provide its citizens with top-notch public services, it is crucial for SMEs to comply with tax regulations. However, if the government does not ensure the issue of effective public governance, this goal cannot be achieved (Masawa 2017). Observations in Tanzania show that a big portion of Tanzanians do not fully abide by tax laws by foregoing requesting receipts after the transaction (Mlay, 2015). This causes a significant loss of tax revenue. Additionally, by ensuring that the Tanzania Revenue Authority (TRA) has dependable systems, equipment, and technologies, as well as staff members who possess the necessary knowledge, tax compliance can be increased through high-quality customer service. The payment of various taxes will be made simpler as a result. According to the Service Quality (SERVQUAL) model, the service quality characteristics of assurance, tangibility, responsiveness, reliability, and empathy must all be met in order for tax compliance to be observed in the nation. Additionally, more effective equipment and systems are required to attain high levels of tax compliance (Parasuraman, 1988). Since SMEs are among the businesses with high sales volumes and high profits, it is expected that they will pay taxes and contribute significantly to the GDP of the nation. However, some people may not pay their fair share of taxes because they believe that the costs of compliance are too high given their meagre financial resources (Mahangila, 2017). This presents a challenge to the government in providing better services to its citizens and in supporting various development projects, from which SMEs themselves must derive direct advantages. As a result, SMEs must be encouraged to comply with tax laws. Therefore, utilising SMEs in Babati town council as a case study, this study examined tax compliance in Tanzania.

1.1 Statement of the Problem

Tanzania is one of the nations that lose tax revenues because of taxpayers who use both legal and illegal tactics to evade paying taxes (Avoidance and evasion). The public sector suffers from the lost tax revenue as a result of tax evasion, which reduces its ability to support its essential expenditures. Taxes play a crucial role in every economy’s progress, so non-compliance is a worry that must be handled. In many sub-Saharan countries, tax authorities struggle to encourage taxpayer compliance (Kuug, 2016). In Tanzania, tax evasion has cost the government a lot of money due to government carelessness (Daily News 7th December, 2015). The new regime’s efforts to combat tax evasion have led to steady tax revenue collection (World Bank, 2016). Even though most businesses don't pay their taxes, some do that in one way helped Tanzania’s tax to GDP ratio increased.
from 13.5% in 2015/2016 to 14.8% in 2016/2017, but actual revenue is still behind forecasts (TRA Report, 2017). It is thought that provision of quality services and good governance by the government may have impact on tax compliance by SMES. Hubbard and Akhand (2016) found that persuading and coercing tax payers’ influences voluntary tax compliance. Lubua (2014) suggested using ICT to encourage voluntary tax compliance. Regional tax administration, service quality, taxpayer behaviour, and level of satisfaction influence tax compliance, (Hidayati et al, 2014). However little is known about SMES tax compliance as a function of service quality, and good governance by TRA. This article investigated the impact of TRA’s tax services and good governance on tax compliance in Tanzania, by using data collected from SMES operating at Babati council in Manyara region. The purpose of this paper is to establish the existing relationship between the perceived factors that impact tax compliance in Tanzania and develop the best ways to promote high tax compliance level in our economy. Specifically the study intended to; examine the impact of provision of quality services and good governance by TRA on Tax compliance. Moreover the study is relevant to the tax system in Tanzania, and will improve tax compliance for policymakers and tax authorities. It is expected that the findings would provide a useful source of information and inspiration for professionals working in SMEs development to identify ways to voluntarily comply with tax laws and regulations. The findings of the study insisted to the government, SMEs, and other stakeholders that voluntary tax compliance is the best practice for the government and the society at larger

II. THEORETICAL CONSIDERATION

The study is guided by the following theories, fiscal exchange theory, and including one Service Quality Model

2.1.1 Fiscal Exchange Theory

The fiscal exchange theory is a product of the economic deterrence and the social psychology models (McKerchar and Evans, 2009). This theory came upon the existence of a social, relational or psychological contract between the government and the taxpayers (Frey and Feld, 2002; Torgler, 2003; Fjeldstad, et al., 2012). The Fiscal Exchange Theory stipulates that the state expenditures can be a triggering factor for tax compliance. This is because every citizen would always love to see the direct impact (goods and services provided by the government) of the tax he or she pays to the government. (Alm, McClelland and Schulze, 1992; Alm, 1999; Fjeldstad, et al., 2012). On this foundation taxpayer are perceived to exchange their purchasing power in the market in return for government goods and services (Fjeldstad, et al. (2012:4). Therefore the willingness to comply with tax laws and regulations by the taxpayers is built on the foundation that there will be a satisfaction on the services provides by the government even if there is no noncompliance. (Torgler, 2003). When taxpayers are dissatisfied with the provision of services from the government then the probability of reducing or noncompliance can emerge (Spicer and Lundstedt, 1976; Smith, 1992; Alm, 1999; Palil, 2010). However, this theory offers other suggestion that of negotiation between two parties that is the state and the taxpayers which is regarded as the foundation in relation growth on the mutual rights, accountability and obligations between the government and society (Fjeldstad, et al., 2012). The study by Alm (1999) revealed that facts exist from empirical, experiment and parallel researches, that tax compliance is affected by collective decision process. In most liberalized states tax payers are in position to bargain their tax agreement with the government (Torgler, 2003b).

2.1.2 Service Quality Model

The model was developed by Parasum et al in 1988. It was purposely formulated to help in evaluation of quality of services and organizations such as TRA. The model has got five service dimensions namely tangibles, reliability, assurance, responsiveness and empathy. Tangible dimension explain the ability of organization to manage its tangibles example physical facilities appearance, personnel, equipment and communication materials. Reliability refer to the ability of the service provide to perform the promised services accurately and dependably. Assurance refers to courtesy and knowledge of employees and their ability to convey confidence and trust. Empathy considers caring and giving attention to customers or it can be simply explained as ability of the organization to put itself in the customer’s shoes. Responsiveness refers to be willing to help customer and provide services with accuracy and services on time. Therefore for the organization to achieve service quality particularly TRA as a service organization it must make sure that its materials, system, personnel and equipment work better with efficiency in order to encourage taxpayer to pay their tax liabilities voluntarily. Also TRA employees should posses, skills, knowledge, competence, integrity and willingness to help taxpayers at a right time with maximum cares, simply placing themselves in the shoes of their customers or the tax payers.

Empirical Review

The perception of tax service quality by taxpayers, and it’s implication on tax compliance.

Kotler & Keller (2009) defines service as any intangible act or performance that one party offers to another that does not result in the ownership of anything. Therefore, service can be defined as an intangible offer given by one party to another party in the exchange of money for enjoyment. Quality is the totality of features and characteristics of a product or services that have the ability to satisfy customer needs (Kottler and Keller, 2009). Service quality is defined as the differences between customer expectations and perceptions of services (Parasuraman, et al., 1988). This study defines service quality as the capability of the service provider to meet or exceed customer expectations about the services offered to them. The objective of any tax administration is to offer better services to taxpayers. In the modern society, they should offer services to citizens and in the process become more and more specialized. (Karingi,Wanjala, Pamba and Nyakango, 2005). This argument was supported by stating separately that the manner in which taxpayers are treated in the course of the tax service provision has an impact on their compliance behavior (Feld and Frey, 2006). According to (Torgler, 2007) the willingness of taxpayers to cooperate with tax authority will increase, if the authority sees itself as service institution and provide quality service and treat taxpayers as partners. The delivery of quality service to taxpayers will strengthen their willingness to comply with tax laws voluntarily.

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and as a consequence contribute to the overall level of tax compliance (OECD, 2007). Tax offices are increasingly becoming aware of the necessity to accord taxpayers the status of customers as many tax authorities such as those of Australia, France, Sweden, UK and the US have reconstructed their approaches towards taxpayers by giving them more consideration to their tax service needs and treating them as clients.

Nurhayati, Elly and Diamonalisa (2015) conducted a study on the influence of tax officers service quality and knowledge of tax on individual tax payer compliance in Indonesia. 100 respondents were the sample for the study and the study employed explanatory research design and data were collected through questionnaires. Data were analyzed using multiple regressions. The tests results for the study indicates that knowledge of tax and the quality of tax officers service have significant influence on tax in Indonesia. The study concluded that service quality offered by the tax officers to individual tax payer is essential matter in providing satisfaction and it will encourage people to fulfill their tax obligations in time. Another study by Taya et al 2017 also established that, quality of service can significantly influence the consciousness of the tax payer. Mustapha et al (2014) in their study on tax service quality on the use of online tax system in Nigeria using the sample of 206 respondents concluded that tax service quality is an important determinant in adopting online tax system that offer relevancy to the tax administration system.

Moreover Awaluddin and Tambaruka (2017) have researched on the effect of service quality on compliance payment of motor vehicle tax in Kendari. Data were obtained through questionnaires and documentation. 98 respondents were used as a sample. Multiple linear regressions were used in data analysis. The study found that tax service quality affects significantly to the tax compliance habit of motorized vehicle tax payers. This means that the higher the quality of services offered in tax offices the higher the tax payer compliance in paying their tax obligations. On the other hand the study by Madgid (2015) using exploratory design with 48 respondents found that service quality in Tax service office has no effect on the obedience of tax reporting compliance level

The impact of quality Public Governance on Tax Compliance

World Bank (2006) defines public governance quality as the perception of the citizen on the ability of the governments to select, monitor and replace leaders with the capacity to manage resources effectively for the benefits of all citizens. Rotberg (2005) describes public governance quality as the citizens’ satisfaction with the management, supply and delivery of political goods to the citizens of a country. This study defines public governance quality as the meeting or exceeding citizens’ expectations of the process to select, monitor and replace leaders who are able to control and manage resources of the nation efficiently and effectively and place sound policies that help manage national resources.

Public governance quality influences tax compliance. Where there is public governance quality, the tax system ought to be good and where the tax system is good then there should be public governance quality. (Everest Phillip and Sandall, 2009). What happens in governments should matter to taxpayers because they provide finances inform of tax payment for its sustenance. Therefore, the compliance behavior of taxpayers may be affected by governance affairs either positively or negatively. In analyzing the relation between the taxpayers and governments, it was concluded that tax compliance is influenced by vertical contacts (Levi, 1988). According to him, the contract between the taxpayers and government is a vertical contract, referred to as a quid pro quo of taxation. These contracts focus on whether the taxpayers access public goods in exchange for the taxes paid. According to the quid pro quo argument, complying with tax law provisions partly depend on whether the services provided by government are sufficient in exchange for taxes paid (Lassen, 2003). This argument is supported by (Levi, 1988) who argued that if the taxpayers perceive that the rate of exchange from tax to political goods is low, then the taxpayers will feel that the government has not complied with the contract and as a result voluntary tax compliance declines. The argument by (Levi, 1988) was supported by (Besanco, 2003) who stated that there is a social contract between the governments and taxpayers which embodies effective delivery of services. Alm, McCleuard and Schulze (1992) made observations supporting (Lassen, 2003) who argued that taxpayers may feel the attractiveness of the quid pro quo contract diminished leading to lower tax compliance where the services provided by the government are not as expected or the exchange rate is low due to corruption. Another who supported Lassen’s argument is (Torgler, 2003). He noted that when the government’s integrity goes down, hence fail to honor their honesty, an individual’s tax compliance may be low. He concluded that positive actions by governments may cause taxpayers to develop positive attitudes and commitment to tax system and payment resulting to improve compliance.

In reviewing the relation between the quality of public governance and compliance further, (Everest Philips and Sandall, 2009) concluded that there is a connection between public governance quality and taxation and that quality governance delivers good tax systems which facilitate good governance. Where there is good governance, quality public goods should be provided to the public and where governments have failed to provide services such as public amenities and infrastructure in exchange for tax payment, citizens also become reluctant in tax payment. There is a significant positive association between the benefits derived from services provided by the government to its citizens and the willingness of taxpayers to pay taxes. (Alm, Martinez – Vazquez and Achneidler, 2003)

Kiow et (2016) al conducted a study on determinants of tax compliance behavior of individual taxpayers in Malaysia. The study found that tax compliance behavior of tax payers is affected by ethical perception of the individual and their ethical perception is influenced by transparency in public governance, the study further found that tax compliance increase if government use tax monies wisely or when people enjoy benefit for the taxes paid in terms of social amenities and public good This is contrary with other scholars who argued that high degree of transparency can cause less trust as it will enable tax payer to audit the government for some small mistakes (Kiow et al 2016). Ali, et al (2013) conducted a study to investigate factors affecting tax compliant attitude in Africa. Four countries were involved in the study; the countries were Tanzania, Kenya, Uganda and South Africa. The aim of the study was to evaluate and compare differences in perceptions of people’s attitude on tax compliance. The study used attitude and perception data from the new round 5 of afro
barometer surveys. The study found that differences and similarities exist among the factors influencing tax compliance in the four selected countries. Also the analysis found that that provision of quality service to the public is likely to promote tax compliance in all four countries. In the study the key discovery that is applicable to all the four selected countries is that tax compliant attitude is discouraged by the payment to non-state actors such as criminal gangs.

III. METHODOLOGY

The study has set model specification to examine the relationship between provision of quality services and good governance to SMES and Tax compliance in Babati town council in Tanzania. On the basis of the empirical model specification below:

**Research study model**

\[ TC = \beta_0 + \beta_1 SQ + \beta_2 MT + \beta_3 PG + \epsilon_i \]

Whereby; TC = Tax compliance; SQ = Service Quality; MT= Multiple taxation
PG = Good Public Governance

Thus, tax compliance is used to measure performance of tax revenue collection in Tanzania via SMES while SQ (service quality,) MT (Multiple taxation) and PG (public governance) are independent variables considered for the study. \(\beta_1\) Indicates how a unit changes in independent variable affects the dependent variable and \(\epsilon_i\) is the error term to capture other variables which were not included in the model. The analysis done based on primary and secondary data collected from SMES operating in Babati town council in Manyara region. The area of the study was chosen simply because the area has significant sources of data to be collected sufficiently to cover the study requirements. The study is a descriptive one that according to Kothari (2004) includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. The main characteristics of this method was that the researcher had no control over the variables; he could only report what has happened. The study explained the influence of various factors on tax compliance taking SMES in Babati town council as a case study. The study employed mixed research approach which consists of a combination of quantitative and qualitative analysis. The population of the study is about 2,500 SMEs which are registered as taxpayers at Babati town council. This study applied both systematic sampling and purposive sampling techniques to select a sample size of about one hundred (100) respondents were selected, as per Yamane(1967), claim which says that a good sample size is that one with a 0.10 sampling error.

\[ n = N / (1 + N (\epsilon) 2) \]

\[ n = 2500 / (1 + 2500 (0.10)^2) \]

\[ n \approx 96 \text{ SMEs} \approx 100 \]

Therefore the estimated sample size for this study involved 100 SMEs respondents.

Reliability was tested by use of ten questionnaires which were piloted with randomly selected SMEs employees who were not included in the final study sample to avoid response bias. Their views were evaluated and incorporated to enhance content and construct validity of the questionnaire. The rule of the thumb suggests that 5% to 10% of the target sample should constitute the pilot test (Cooper and Schilder, 2011; Creswell, 2003; Gall and Borg, 2007). The pilot test sample was within the recommendation. The ten questionnaires were coded and input into Statistical Package for Social Sciences [SPSS] version 16 for running the Cronbach reliability test. The reliability of the questionnaire was tested using the Cronbach’s alpha correlation coefficient with the aid of Statistical Package for Social Sciences (SPSS) software. The results of the reliability test produced an overall Cronbach Alpha correlation coefficient of 0.887. The closer Cronbach’s alpha coefficient is to 1, the higher the internal consistency reliability (Sekaran, 2003). A coefficient of 0.7 is recommended for a newly developed questionnaire and therefore 0.884 was adequate for this study.

IV. FINDINGS AND DISCUSSION

The findings and analysis covered the factors influencing tax compliance, in Babati town council Manyara region in, Tanzania where owners of SMEs are clients of TRA or rather taxpayers, were put under scrutiny so as to collect relevant information for this particular study. However discussions of the findings centered on the following sub topics, and where need be supplementary information may be used to strengthen the study. (i) The impact of service quality to members of the community on tax compliance in Tanzania (ii) The influence of good governance on tax compliance in Tanzania, and (iii) The effect of multiple taxation on tax compliance

4.1 Demographic data

The study collected data from the respondents chosen from owners of SMEs in Babati town council, and from TRA officials. A total of one hundred respondents were interrogated ninety respondents were taken from SMEs, while ten were from TRA office. The analysis of the information was done and revealed that out of whom, forty one (41) were male, equivalent to forty one percent (41%) while fifty nine (59) were female equivalent to fifty nine percent (59%). This entails that females dominate in business and this might be due to the fact that women are supported by almost everybody and some women are serious in issues pertaining to business. It was further revealed that forty seven (47) respondents had primary to secondary levels education, this is equivalent to forty seven percent (47%) of the total respondents who took part in the study. Moreover results indicated that fifty three (53) respondents had college to University level of education, which is equivalent to fifty three percent (53%) of the total respondents This implies that SMEs owners have knowledge and skills especially entrepreneurial skills that may help them to manage and overcome challenges in their business as well as understanding the importance of complying with the tax laws and regulations.

Moreover, it was revealed that majority of the respondents; about sixty three (63) equivalents of sixty three percent (63%) had an experience of more than 4 years in business activities, while thirty seven (37) equivalent to thirty seven percent
(37) of the respondents had experience of less than four years. This means majority of the respondents are conversant with business activities and have got adequate information about taxation issues in business.

4.2: The effects of services quality provided by TRA towards SMEs tax compliance

The study examined on the quality of services offered by TRA to the general public, and the findings were as follows, thirty five percent (35%) of the respondents said the quality of services is good while thirteen percent (13%) claimed that the services quality provision is moderate as opposed to be best, while, fifty two percent (52%) have claimed that the services is still poor. The researcher went further to investigate on the reasons which made majority of the respondents to consider services provided by TRA to be poor. It was found that most people complained about the E-system and lack of care from the TRA employees. In addition the respondents have explained the issue of network problem for TRA system as a critical challenge that discourages compliance process. Moreover the findings have revealed that costs of purchasing EFD machines were a burden to small taxpayers. Besides there is lack of trust between TRA officials and the taxpayers, it was claimed that usually TRA officials don’t trust the taxpayers accounts and in most cases suspected the existence of frauds that involves under estimation of the taxable income even if the taxpayer has brought the correct estimations. In fact this demoralised the good intention of taxpayers who want to pay their tax obligations willingly. It was further noted that some of the employees of TRA used to involve themselves in corruption deals which affected the attitude of the taxpayers and ultimate tax compliance. Moreover, it was revealed that TRA officials consider themselves to be brighter or know everything such that, they never consider taxpayers situation and ideas. All in all, forty eight percent (48%) of the respondents were generally happy with current services as there were some signs of improvement in many public organizations and agencies as compared to some years back like 2000 to 2015. This may directly improve tax compliance among SMEs in Tanzania, if the situation is going to continue.

Descriptive statistics analysis

The response mode had five Likert scale points ranging from 1= strongly disagree to 5= strongly agree. The overall results of descriptive analysis on the quality of services provided by TRA have been presented in the table 4.1 where the mean score of 1.00-1.80 indicates that the quality of services of TRA is very poor, the mean score of 1.81-2.60 indicates that TRA has poor services, the mean score of 2.61-3.40 indicates “Service quality of TRA is moderate while mean score of 3.41-4.20 and 4.21-5.00 indicated service quality of TRA is good and “very good respectively. The overall results in table 4.1 indicated the overall mean of 2.57. According to the scale it can be deduced that the quality of services offered by TRA is not satisfactory. Moreover, most of the variables mentioned were rated poor and moderate with mean of less than 3.4. If taxpayers are not feeling satisfied with the services tax compliance is in jeopardy. In addition the overall standard deviation of 0.148 confirms a slight variation in views of the respondents.

Generally the findings of this study have revealed that TRA officials do not fully possess all the dimensions of the service quality model. This in one way or another may discourage the good intention of the taxpayer to fulfill their tax obligations. The findings conquer with service quality model as established by Parasuman et al (1988) that the quality of services in organizations is important in inviting customers. The model suggests that for tax compliance to be observed in the country, service quality dimensions that are reliability, tangibility, responsiveness, empathy and must be assured. It was insisted that in order to achieve high level of tax compliance equipments and system must work better. Moreover the findings are consistent with that of Mustapha et al (2014) who concluded that tax service quality is an important determinant in adopting online tax system that offer relevancy to the tax administration system and tax compliance.

4.3 The impact of good public governance on tax compliance among SMEs

The study ought to find out the implication of good public governance on tax compliance by SMEs in Babati town council. The analysis is done in two dimensions namely; social services, and handling of Corruptions. The research sought to investigate whether tax payers are feeling satisfied with the social services such as health services, education services, infrastructures and other services that are offered by the government. The study revealed that majority of tax payer who are accounted up to 73% are not happy with the social services offered by the Government, on the other hand only 27% are feeling satisfied with social services offered by the Government. Provision of quality social services to the citizens promote compliance while the poor services offered by the Government will attract non – compliance. The study investigated the issue of corruption to find out whether it is properly handled in Tanzania. According to the findings, a number of the selected tax payers that is 47% were of the opinion that the issue of corruption is properly handled in Tanzania. The remaining respondents that are 53% have commented that the issue of corruption is not properly handled in Tanzania. In addition the significant number of study respondents had a an opinion that the issue of corruption is properly handled in Tanzania and comment that recently the government have tried hard to control this habit in most of its offices, this is the bright future towards elimination of corruption and hence high level of tax compliance. Diversification of public funds due to corruption discourages tax compliance behavior of tax payers.

Descriptive Statistics analysis

The response mode had five Likert scale points ranging from 1= strongly disagree to 5= strongly agree. The overall results of descriptive analysis on the quality of public governance have been presented in the table 4.2 where the mean score of 1.00-1.80 indicates that the public governance is very poor, the mean score of 1.81-2.60 indicates that the public governance is poor, the mean score of 2.61-3.40 indicates the public governance is moderate while mean score of 3.41-4.20 and 4.21-5.00 indicated that the public governance is good and very good respectively. The overall results in table 4.2 indicated the overall mean of 2.45. Basing on the above scale it can be correctly said the quality of public governance is still poor. Moreover, most of the variables mentioned were rated poor and moderate with mean of less than 3.4. Poor quality of public governance discourages tax
Findings in table 4:3 that present correlation between tax compliance and superior social services offered by the government reveals the correlation coefficient of 0.807 at significant at the 0.01 level. This implies that strong positive relationship between social services offered by the government and tax compliance level by SMEs. The findings have shown that tax compliance behavior of majority of the respondents is influenced by the quality of social services offered by the Government. Therefore it is clearly indicated that provision of superior social services can encourage tax payers to be more tax compliant. Generally the findings have shown that taxpayers’ level of compliance is influenced by good public governance that involves provision of superior social services, absence of corruption as well as enacting good laws for the welfare of the citizens. The findings have revealed that, majority of taxpayers are not feeling satisfied with social services, such as education services and health services. These findings concurred with the study by (Everest Philips and Sandall, 2009) who established that there is a positive relationship between public governance quality and tax compliance and that quality governance brings good tax systems that enable good governance and hence increase tax compliance

4:6 Regression Analysis

Table 4.4: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted Square</th>
<th>R Std. Error of Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.93</td>
<td>0.865</td>
<td>0.861</td>
<td>0.24773</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), PG, SQ, MT

The findings in Table 4.4 indicate the existence of positive relationship between tax compliance and all three independent variables of the study given by correlation coefficient of 0.93. Moreover the table shows the coefficient of determination that is Adjusted $R^2 = 0.861$. The adjusted $R^2$ means that 86.1% of the variability in the dependent variable tax compliance is explained by service quality, Multiple taxation and good public governance. Furthermore 13.9% of the variability of the dependent variable tax compliance is explained by other factors that are not accounted for in the model of this study. It must be noted that the Adjusted $R^2$ value since it is above 50% it makes the model to be acceptable and enable independent variables to be explained.

Table 4.5: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
</tr>
<tr>
<td>(Constant)</td>
<td>.102</td>
<td>.080</td>
<td>-1.277</td>
</tr>
<tr>
<td>SQ</td>
<td>.160</td>
<td>.039</td>
<td>.221</td>
</tr>
<tr>
<td>MT</td>
<td>.161</td>
<td>.150</td>
<td>.104</td>
</tr>
<tr>
<td>PG</td>
<td>.763</td>
<td>.106</td>
<td>.667</td>
</tr>
</tbody>
</table>

a. Dependent Variable: TC
Source: Field data (2022)

Table 4.5 Above depict the regression analyzing between tax Compliance which is dependent variable and factors that

Correlation Analysis

Correlation between tax compliance and superior social services offered by the government

Table 4.3: Correlation analysis

<table>
<thead>
<tr>
<th>Tax Compliance</th>
<th>Social services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Correlation</td>
<td>.807**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td>100</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>.807**</td>
</tr>
<tr>
<td>N</td>
<td>100</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Field data (2022)

4.4 Determination of tax compliance level

The study investigated on the payments of tax voluntarily by using a five point likert scale model and revealed that 17% agreed that they comply voluntarily while 17% were neutral about the statement and 67% of the respondents disagreed with the statement that they pay their share of tax voluntarily. From the findings, it is clear that majority of taxpayers do not pay their tax obligations voluntarily, that is they pay tax by force, this means without force tax compliance could be in jeopardy. This is a sign of low level of tax compliance. Moreover when considering the right time for submission of tax returns 72% of the respondents agreed that they submit their tax returns on time while 28% disagreed with the statements Therefore from the findings it can be deduced that many people file their tax returns on time. This is one of a good step towards achieving high level of tax compliance. With regards to the submission of correct income only 12% of the selected tax payers agreed that they always report the correct income to TRA. Moreover a significance number of the respondents who confirmed that tax payers don’t pay their taxes willingly. Sad enough many of the respondents that said that the level of compliance is not satisfactory as majority of taxpayers have declared that they do not always report their correct earnings to TRA. However the majority of the respondents corresponding to 56% have declared that they do not always report their correct earnings to TRA. This implies that a tax compliance level is still low among the SMEs. Generally it can be said that the level of compliance is not satisfactory as majority of tax payers don’t pay their taxes willingly. Sad enough many of the taxpayers have claimed that they pay their taxes by force, and in most cases they don’t report the correct income to the tax authority. This implies low level of tax compliance among SMEs. The findings are consistence with the findings by Masawa (2017) who confirmed that tax compliance level of SMEs in Tanzania is not satisfactory.

Compliance. In addition the overall standard deviation of 0.124 confirms a slight variation in views of the respondents.
influence tax compliance which is the independent variables that is TRA services quality, multiple taxation and the quality of public governance. The findings have revealed that all factors have significance influence on tax compliance since its significant value is less than 0.05 this means that the change in one unit that is either increase or decrease lead to the significance changes in tax compliance where all factors have positive relationship with tax compliances this means are the increases in one of the factor lead to increases in tax compliances. Hence a unit increases in TRA service quality lead to 0.160 increases in Tax compliance while a unit increases in multiple taxation lead to 0.161 increases in tax compliances also a unit increase in public governances lead to 0.763 increases in tax compliances. The findings of this study have revealed that TRA does not fully possess all the dimensions of the service quality model though there are some that are observed. The findings conquer with service quality model as established by Parasuman et al (1988) that the quality of services in organizations is important in inviting customers. For the sake of this study the quality of services offered by TRA would attract tax compliant behavior of SMEs.

In this study the matter of public governance was found to be a strong contributing factor that influences tax compliance level of the taxpayers. This was evidenced by the correlation coefficient of 0.763 between public governance factors and tax compliance. Studies by Everest-Phillip and Sandal, (2009), Besancon, (2003) also found that the quality of public governance was a strong factor that influences tax compliance among taxpayers. Particularly in this study the researcher found that taxpayers based their willingness to pay their tax obligations on the services delivered by the government. Provision of services as expected by taxpayers enhances compliance while deviations from expectations attract tax non-compliance.

Therefore, regression model for this study is expressed as follows.

\[ TC = -0.102 + 0.160SQ + 0.161MT + 0.763PG \]

Where, TC = Tax compliance; SQ = Service Quality; MT= Multiple taxation and PG = Good Public Governance

Generally the findings have clearly indicated that tax compliance level is not satisfactory since SMEs do not fully comply with the tax laws and principles as they don’t fulfill their tax responsibilities voluntarily and they don’t report their correct income. Moreover the findings revealed that tax compliance particularly of SMEs in Babati town council is influenced by service quality of TRA, multiple taxation and good public governance. These findings concur with the study findings by Machogu (2011) who established that the quality of public governance, service quality, attitudes and ethnicity influence tax compliance in Kenya. Also the findings are consistent with the study by Masawa (2017) who concluded that, service quality; multiple taxation, taxpayer trust, and public governance quality are the factors that explain voluntary tax compliance in Tanzania.

V. CONCLUSION

The study concluded that quality services and good public governance and multiple taxation had impact on tax compliance in Tanzania. It was further concluded that quality services, good public governance and multiple taxation had significant impact on tax compliance as explained by small and medium enterprises operating at Babati town council. The research results indicated the existence of positive relationship between tax compliance and all the three independent variables of the study given correlation coefficient of 0.93, and the coefficient of determination that is adjusted $R^2 = 0.861$ which implies 86.1% of the variability in the independent variable is explained by service quality, good public governance and multiple taxation had significantly affected the tax compliance of selected small and medium enterprises operating at Babati town council Manyara region in Tanzania.

The study recommended that Tanzania Revenue Authority should struggle to offer high quality services and good governance to the taxpayers. In fact services provided by the Tanzania revenue Authority, were rated very poorly, therefore there is every reason of improving them. Besides the government, should raise awareness to the public on the tax system, tax incentives, tax reliefs, record keeping and importance of tax compliance. Furthermore since the study has shown a strong positive relationship between quality social services and the tax compliance habit of the taxpayers the government should continue to invest in superior social services such as health services, education services, and infrastructure. Services should base on scientific and needs of society. In addition taxpayers in this case SMEs are encouraged to develop the culture of paying their tax obligations willingly and without force by reporting correct income to the tax authority and at a right time. This is important for the growth of the country’s economy.

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AUTHORS

First Author – Fadhili Ephraim Maseko, Lecturer from the Institute of Accountancy Arusha -Dodoma Campus

Second Author – Ibrahim E. Sawe, Lecturer from the Institute of Accountancy Arusha

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Leadership Roles And Performance At The Office Of The Auditor General In Kenya

Simon Mutinda Mutua *, Linda Kimencu **

* Postgraduate Student, MBA in Strategic Management, Kenyatta University, Kenya
** Lecturer, School of Business, Economics and Tourism at Kenyatta University, Kenya

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Abstract- Kenyan state-owned corporations have recorded poor performance that is linked to bad management practices. These practices have created gaps that allow for corruption, nepotism and mismanagement and poor quality of services and products given to the public. The OAG has in the past also recorded poor performance and hence this study sought to assess the influence that leadership roles have on performance. The study was enriched by the institutional theory and employed descriptive research design. 238 respondents working across the 11 regional offices of OAG were included in the study and helped by filling the semi-structured questionnaire. The collected data was analyzed using SPSS where findings revealed showed high overall mean score of (M=3.921 and M=3.871) from descriptive analysis; correlation analysis showed leadership roles at a high of (r =.897) and regression coefficient was at β=.338. The study findings also showed that 89.6% of performance at the OAG is attributed to leadership roles. These findings led to the drawn conclusion that leadership role led to improved performance at the office of the auditor general. The performance at the OAG was measured in terms of timely delivery of reports, quality and comprehensive reports and public satisfaction with the services offered by OAG. While leadership roles included delegating and assigning roles, strategic planning and using different leadership styles that worked to manage work roles resulting in higher performance rates. The study recommended that to improve performance, firm management to use leadership roles and its elements.

Index Terms- Leadership roles, Strategic plans, Resource allocation, Change Management, Performance

I. INTRODUCTION

Organizational performance is affected by the changes in the operating environments including advancing technologies, high competitiveness, diversification of work environment, turbulence, cost of operations and globalization effect (Ramlawati & Kusuma, 2018). Poor performance in organizations is as a result of ineffectif firm structure, practices and systems and for government institutions, the inefficient quality service delivery. Muthengi (2017) shared that in government institutions and departments, the performance is low as characterized by low quality services, unmotivated employees, gaps in processing and delayed reports. Thus, organizations are seeking means that will reverse the poor performance. There are many measures that can be adopted but Anil and Satish (2016) noted that attaining high performance and competitiveness in organizations was through engaging strategic leaders. Kiprotich, Njuguna and Kilika (2018) noted that as public and private organization stem the tide of global competition, they have turned to use of modern technology and employing strategic leadership. But in some instances, the poor operational performance like at the Kenya Revenue Authority stems from bad leadership, resistance by staff, little financial resource allocation and inability to get modern technology.

On leadership roles, where Schechner (2017) noted it is based on strength and commitment to the organization is drawn from support of senior managers. It is also guided by the leaders and leadership aspects like belief system, guidance and directions and support and conviction. The leadership also supports the implementation of management reforms through availing the necessary resources, improving staff competencies through trainings, performance appraisals and quality management options (Jimoh, Oyewobi, Isa & Waziri, 2019). The leaders must be visionary and set trends and expectations from all subordinates and they must support the philosophy of quality management. The leaders should be able to convince the subordinates to embrace new working systems and operations and through trainings enhance staff competencies. Resource mobilization and allocation is dependent on leadership qualities and principles of leadership (Pambreni, Khatibi, Azam & Tham, 2019). For the senior managers to embrace and commit to quality management, they need to be trained and informed of its value and spearhead the process. Some of ways of encouraging quality management is through rewarding and punishing employees (Rahman, Othman, Yajid, Rahman, Yaakob, Masri, Ramli & Ibrahim, 2018). Thus, leadership role adopted measurement elements of strategic plans, allocation of resources and change management.

All organizations focus on performance as it informs their capacity to survive and succeed (Abdallah & Alnamri, 2015). It refers to attainment of organizational mission and vision by doing evaluations and assessments that compare output versus inputs. Thus, performance at the Office of the Auditor General (OAG) can be approached and measured in the context of how well or badly this institution executes its mandate. This study employed...
indicators such as timeliness of the delivery of the report, delivery of quality audit reports, provision of forensic audit reports to other departments like the police service and other investigative units and meeting all stakeholders’ expectations.

Based on past reports, the Kenyan state-owned corporations have recorded poor performance that is associated with bad management practices that allow cases of corruption, nepotism, and mismanagement (Koigi, 2016). Due to increased public outcry and demand for better services from the government, there have been reforms implemented to resolve the issue. Thus, this study focused on how leadership roles can be employed to improve performance at the Office of the Auditor General (OAG). The study sought to respond to this research question:

a) What are the effects of leadership roles on performance of the Office of the Auditor General in Kenya?

II. LITERATURE REVIEW

Theoretical Framework

Institutional Theory

The theory was formulated from the research work of Meyer and Rowan (1977) and it is based on social structure and aspects of an organization. It considers the schemes, rules, routines and norms established by the authority figures and leadership in the organization. The theory also dictates the social behavior based on the patterns of social relationships and how they are linked to the social and cultural environment for organizations and enterprises. According to Raynard, Johnson and Greenwood (2015) the theory operates on the approach of getting an understanding of the organizational structure and management practices that is linked to the social and economic pressures. The theory embodies the roles played by different systems within and around the organization. In general, the organization is affected by different systems including the political, social and economic systems and different stakeholders that direct the social behaviors, practices and routines.

The initial formulation of the classical institutional theory is based on integrating concepts of interest-driven behavior and as such it has problems associated with power, interests and conflicts. The context of modern of institutions is that they have complex functional and operating units and inter-connectivity of structures that apply institutional theory may not be easy or practical. The social context has also to grapple with the ever-changing social changes in the environment that businesses operate in (Mohamed, 2017). The theory covers the aspect of the role that leaders play in directing the activities, practices and social behaviors of the people within the organization. The institutional theory works with the foundation of social life in organizations as linked to the social behavior and institutional actors that work with leaders to formulate rules, norms and laws (Willmott, 2015). As such the theory is aligned to elements roles of leaders at the Office of Auditor General (OAG) and performance of the office in dispensing its duties.

Empirical Literature

Ibrahim and Daniel (2019) conducted a study on leadership and organizational performance. The study was based on Coca Cola Company in Abuja, Nigeria. The researcher focus was to link the concept of leadership and performance of firms by collecting secondary data on the journals, internet and company information on its website. The study also used primary data from 250 respondents who are employees of Coca Cola and all the data was analyzed using Pearson moment product co-efficient and regression analysis. The study discovered that the adopted leadership style used by top managers, participatory leadership and delegation of roles and duties in the firm led to higher employee performance, achievement of set goals and positively impacted the organizational performance. The study concluded that organizational performance relied on leadership style, format employed in delegation of duties and roles and participation in leadership functions. Thus it is important for organizations to get the right leader.

Meraku (2017) investigated on role of leadership and its influence on organizational effectiveness. The researcher noted that the crisis in the world is about decision making that is guided by values held by the current crop of leaders in different organizations. The study then examines the leadership qualities and features of Albanian leaders and the case study of Plus Communication Company. The study collected primary data from 100 randomly selected employees from the organization to take part in the study. Revealing that aspects of effective leadership include categorical values, leaders’ image, responsibility and work ethics of leaders and management style and vision have improved the effectiveness of handling job tasks. Some of the important qualities of an effective leader include honest and integrity, competence and credibility, motivational, visionary, good communicator, equality and one with a sense of humor. Adoption of participatory leadership style also led to higher organizational effectiveness. The study concludes that the leaders’ features, qualities and styles are important for gaining organizational effectiveness.

Al Khajeh (2018) study was on leadership styles and its impact on organizational performance. The researcher noted that leadership is a determinant of the success/survival or failure/closure of any enterprise and the employed leadership style can differentiate between the two. The study examined the six main leadership styles namely transactional, autocratic, transformational, charismatic, bureaucratic and democratic and how they influenced organizational performance. The researcher collected both primary and secondary data by looking at past studies and survey that gave quantitative data. The findings showed that democratic, transformational and autocratic leaderships positively impacted organizational performance while bureaucratic, charismatic and transactional leadership styles had negative relationship with organizational performance based on few opportunities and freedoms to the organizational employees.

Kirui (2017) examined the role that transformational leadership had on organizational performance by looking at Kenyan State-Owned banks. The sought to consider what role transformational leadership with aspects like intellectual stimulation, individual consideration, inspirational motivation and idealized influence played in performance of organizations. The study used primary and secondary data and it targeted 137 employees in 22 branches of Post Bank and National Bank in Rift Valley Region. The collected data and was analyzed with the results showing that more than sixty three percent increase in bank performance were linked to transformational leadership and its elements. Further findings reveal that the aspects of
transformational leadership like motivation and stimulation led to noteworthy relationship to firm performance in the government owned banks in Kenya.

Kitonga (2017) examined how strategic leadership practices can affect firm performance when it comes to organizations that are not for profit making. The researcher noted that strategic leadership practices were important during the unpredictable operating environment that had become complex, volatile and uncertain. The focus was on aspects of strategic leadership practices such as direction, controls, ethical practice, staff development on impacting firm performance outcomes. The study used mixed method research design and collected data from 305 strategic leaders using questionnaires and interviews and found out that strategic leadership practices in general was positively correlated to performance in not-for-profit firms. The elements of direction, controls, ethical practice, and staff development had positive correlation to organizational performance.

Conceptual Framework

Figure 1: Conceptual Framework

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**III. RESEARCH METHODOLOGY**

The research design gives complete outline of how the research was carried out and answered the research questions (Rahi, 2017). The study used descriptive research design, which answers the question of what, when and where of the research phenomenon. The population covered all the 1502 employees of OAG, but targeted only 807 permanent staffers working in the 11 regions across the country. Sampling technique helps select a small portion of the population that took part in the study (Etikan & Bala, 2017). Stratified sampling was employed and proportionate sampling was used where 30% from each group was chosen to take part in the study. The sample size of 238 was involved in the study.

Semi-structured questionnaire helped to collect primary data from the respondents who were given one-week to fill and return the questionnaires. A pilot test was done to check that the tool was valid and reliable and results found overall Cronbach Alpha of .809 which is above the set standard of 0.7 and indicated the research instrument was fit for use in the current study. All the quantitative data collected was cleaned and entered into SPSS for analysis. Descriptive analysis, regression and correlation analysis was conducted.

---

**IV. FINDINGS AND DISCUSSIONS**

**Table 1: Leadership Roles**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The leaders are tasked with setting strategic plans</td>
<td>4.094</td>
<td>.972</td>
</tr>
<tr>
<td>The managers assign work roles to all junior staffs</td>
<td>3.951</td>
<td>.806</td>
</tr>
<tr>
<td>The delegation of work tasks is done by leaders in conjunction with other staffs</td>
<td>3.945</td>
<td>.724</td>
</tr>
<tr>
<td>The leaders run all affairs of the office on a daily basis</td>
<td>3.663</td>
<td>.831</td>
</tr>
<tr>
<td>The leaders are competent to handle any changes at the working space</td>
<td>3.8</td>
<td>.985</td>
</tr>
<tr>
<td>The leaders use different styles including democratic, transformational and autocratic styles</td>
<td>4.013</td>
<td>.667</td>
</tr>
<tr>
<td>The leaders motivate employees for attainment of organizational goals</td>
<td>3.972</td>
<td>.796</td>
</tr>
<tr>
<td>The leaders also work towards human capital development</td>
<td>3.934</td>
<td>.884</td>
</tr>
<tr>
<td><strong>Aggregate Score</strong></td>
<td><strong>3.921</strong></td>
<td><strong>.833</strong></td>
</tr>
</tbody>
</table>

Table 1 show that leadership roles affected performance at the office of the auditor general. This is based on overall score that was at a high (M =3.921 and SD = .833). Just as Ibrahim and Daniel (2019) revealed that when an organization is able to get competent and right leaders, then they can attain stated organizational goals. The value and role of leaders improves performance outcomes of organizations. In addition, Al Khajeh (2018) posited that different leadership styles affect organizational performance. Leadership styles including transactional, transformational, charismatic, autocratic, democratic and bureaucratic led to better firm performance. Kirui (2017) agrees that leaders are a source of inspiration and motivation that
influenced performance of the organization. Furthermore, Kitonga (2017) found out that strategic leaders are concerned with staff development, directing and controlling conduct of junior officers that result in better performance in organizations. Some of the best qualities include honesty, integrity, competences, visionary and great communicator, which Meraku (2017) revealed improves performance outcomes for firms.

Table 2: Organizational Performance

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OAG has increased its timeliness in delivery of reports</td>
<td>3.768</td>
<td>.814</td>
</tr>
<tr>
<td>The reports are comprehensive</td>
<td>3.926</td>
<td>.986</td>
</tr>
<tr>
<td>The audit reports are of high quality</td>
<td>3.877</td>
<td>1.15</td>
</tr>
<tr>
<td>The stakeholders are satisfied as the OAG office meets their needs</td>
<td>3.7</td>
<td>.856</td>
</tr>
<tr>
<td>The OAG is able to fulfill its mandate</td>
<td>3.865</td>
<td>1.06</td>
</tr>
<tr>
<td>The OAG delivers forensic audit reports to other departments/ministries</td>
<td>4.09</td>
<td>.593</td>
</tr>
<tr>
<td><strong>Aggregate Score</strong></td>
<td><strong>3.871</strong></td>
<td><strong>.909</strong></td>
</tr>
</tbody>
</table>

Table 2 shares the findings after descriptive analysis was conducted on the dependent variable of the study. The respondents agreed that organizational performance improved as based on high scores of (M=3.871 and SD=.909). Researchers Abdallah and Alnamri (2015) agreed with this finding by noting that high performance scores are important for survival of organizations. In addition Ireland, et al. (2014) agrees that firm performance relies on getting quality outcomes by learning on new trends, shifting internal processes and seeking to meet the customer and general public’s needs and expectations. Similarly, Luo, et al. (2016) argues that performance is linked to the decision making processes that change behaviors leading to better service quality and meeting the goals of the organization. While Schechner (2017) revealed that performance is about effectiveness of organizations and capacity to meet its goals and the needs of its stakeholders.

Table 3: Correlation Analysis

<table>
<thead>
<tr>
<th>Organizational Performance</th>
<th>Leadership Roles</th>
<th>Correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N 176</td>
<td>N 176</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson .897**</td>
<td>Pearson .338</td>
<td>1</td>
<td>.000</td>
</tr>
</tbody>
</table>

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

Table 3 show findings that are positive and strong association between leadership roles and organizational performance at the office of the auditor general in Kenya. The association is based on obtained r values of leadership roles at (r =.897) an indication that leadership role (independent variable) and organizational performance (dependent variable) are moving in the same direction. These results imply that when leadership roles increase so does organizational performance at the OAG.

Regression Analysis

Regression analysis was done to test the cause and effect between the variables and involved the model summary, ANOVA and regression coefficient.

Table 4: Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>R Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.936**</td>
<td>.876</td>
<td>.896</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Leadership Roles

Table 4 shows that coefficient of determination was found to be .896 meaning that performance at the office of the auditor general is attributed leadership roles. Findings revealed that 89.6% of performance at the OAG’s can be traced to leadership roles in this study.

Table 5: ANOVA

<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>1.233</td>
<td>1</td>
<td>1.233</td>
<td>102.75</td>
<td>.000*</td>
</tr>
<tr>
<td>Residual</td>
<td>2.173</td>
<td>174</td>
<td>.012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.406</td>
<td>175</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Organizational Performance
b. Predictors: (Constant), Leadership Roles

The ANOVA test was conducted at a significance level of 0.05 to assess if the regression model used is ideal. Results showed that F calculated was found to be 102.75 and F critical was 3.895 such that F calculated is greater than F critical showing the regression model was ideal and fit for use.

Table 6: Regression Coefficient

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Beta</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Leadership Roles</td>
<td>1.347</td>
<td>.258</td>
<td>5.221</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Organizational Performance

The resultant equation is:

\[ Y = 1.347 + .338X_1 \]

Where:

\[ Y = \text{Organizational Performance and } X_1 = \text{Leadership Roles} \]

Table 6 showed that the study established leadership roles had significant and positive effects to performance at the office of the auditor general in Kenya, based on (b= .338, p = 0.018 < 0.05). The finding is echoed by Ibrahim and Daniel (2019) revealing participative leadership, delegation of duties and leadership styles were positively linked to organizational performance. Al Khajeh
(2018) showed that the different leadership styles improved organizational performance.

V. CONCLUSIONS AND RECOMMENDATIONS

Based on findings on that leadership roles affected the performance at the office of the auditor general, this research concluded that leadership roles had a big impact on performance outcome. It was also concluded that leaders set strategic plans, use different leadership styles, motivate junior staffers, develop, delegate and assign work tasks that led to the improved performance. The study concludes that leaders at the OAG led to its improved performance outcomes. The study also recommended that leaders take part in strategic planning, delegate and manage work duties for improved outcomes. The leaders are asked to motivate junior staff and employ different leadership styles to improve functioning at the organization and lead to high performance outcomes.

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AUTHORS

First Author – SIMON MUTINDA MUTUA, Postgraduate Student, MBA in Strategic Management, Kenyatta University, Kenya

Second Author – LINDA KIMENCU, Lecturer, School of Business, Economics and Tourism at Kenyatta University, Kenya
Minimally invasive surgery in lumbar spine trauma: about 45 cases


* Department of Neurosurgery, Cheikh Khalifa International Hospital, Casablanca, Morocco
** Department of Neurosurgery, Mohamed VI International hospital, Casablanca, Morocco

Abstract

Introduction:
Minimally invasive spinal surgery is a recent concept which continues to evolve and be enhanced by new technologies. It brings together a set of surgical techniques, whose main objective is to reduce trauma associated to the conventional surgical approach while ensuring an identical result.

Method:
It is a retrospective descriptive study of patients undergoing surgery due to back injury in the Neurosurgery Departments of the Sheikh Khalifa International University Hospital and the MOHAMED VI International University Hospital, over a 2-year period from January 2019 to January 2021, with a minimum follow-up of 5 months. We included in our study 45 patients with lumbar spine fracture treated by minimally invasive percutaneous approach, while excluding patients with pathological fracture, neurological deficit and history of spinal surgery. Data were collected from medical records, based on clinical, radiological and surgical data.

Results:
The average age of our patients is 48 years with extremes ranging from 20 to 80 years. The lumbar spine injuries are due to different mechanisms, mainly secondary to trauma induced by falls. The average age of our patients is 48 years with extremes ranging from 20 to 80 years. The lumbar spine trauma was isolated in 32 cases (71.1%). All patients reported low back pain when admitted, the pain was rated as sever (8/10 to 9/10) on the E.V.A scale in 77.8% of patients. Clinical examination found spinal stiffness with no associated neurological damage. The most affected level of injury was the first lumbar vertebra: 49%. The fracture was complex in 32 patients (72.7% of cases). It was of type A according to the Magelr classification in 75% of cases, especially A3.3 and A3.2. In addition to a fast recovery and a decrease of pain, the radiological follow-up shows an improvement of the vertebral kyphosis from 1.4° to 2.5°.

Conclusion:
The minimally invasive method has clear advantages as it is less invasive, significantly reduces intraoperative blood loss and lowers the rate of infection. However, its application depends largely on the spinal pathology in question, the patient’s physiognomy, the surgeon’s experience and the available infrastructure.

I. INTRODUCTION

Minimally invasive spine surgery is a recent concept that continues to evolve and be enriched with new technologies. It brings together a set of surgical techniques whose main objective is to reduce trauma related to the approach while ensuring a good result. This is a descriptive, retrospective, analytical study of patients operated for lumbar spine trauma in the Neurosurgery Departments of the Sheikh Khalifa International University Hospital and the Mohamed VI International University Hospital over a 2-year period from January 2019 to January 2021 with a minimum follow-up of 5 months. We included in our study 45 patients with lumbar spine fracture treated by minimally invasive percutaneous approach, while excluding patients with pathological fracture, neurological deficit and history of spinal surgery. Data were collected from medical records, based on clinical, radiological and surgical data, while excluding patients with pathological fracture, neurological deficit and history of spinal surgery. Data were collected from medical records, based on clinical, radiological and surgical data.

II. Material and Method:

We retrospectively studied the records of all patients, admitted on following a lumbar spine trauma in our departments from January 2019 to January 2021. In this study we included 45 patients operated only by minimally invasive techniques. The surgery was either for antalgic purposes or to stabilize the spine. We analysed the data related to the patient (age, previous history, current work), the presence or not of neurological deficit. Pain was also evaluated according to the Huskisson visual analog scale (VAS). We also analyzed the radiological images taken before and after surgery in order to measure the local spinal kyphosis angle. Only 5 patients were operated under local...
anaesthesia coupled with sedation. The approach was transpedicular in all patients.

III. RESULTS

Between January 2019 and January 2021, 45 patients received surgical management following spinal trauma, 18 by kyphoplasty (36%) and 27 by vertebroplasty (64%). The majority were male, with a sex ratio of 2. The mean age was 48 years (20-80 y). 28 patients had no concomitant disorders, while 4 were diabetic, 7 were followed for hypertensive heart disease, 1 patient was followed for hypothyroidism and 5 for chronic respiratory pathologies, namely COPD and asthma. The main circumstances in which the injury occurred are: MVA, falls and work accidents. Spinal trauma was isolated in 71.1% of cases without any additional lesions.

All patients reported low back pain when admitted, the pain was rated as sever (8/10 to 9/10) on the E.V.A scale in 77.8% of patients. Clinical examination found spinal stiffness with no associated neurological damage. They have been classified as FRANKEI E, according to the FRANKEI classification modified by ASIA.

All patients underwent a spinal scan upon admission. Magnetic resonance imaging (MRI) was conducted in 26% of patients to scan the disco-ligament device adjacent to the fracture. The first lumbar vertebra was most impacted by the fractures in 48.9% of the cases.

A complex fracture occurred in 72.7% of patients, a type A by Magrel classification (75%), in particular A3.3 and A3.2. All surgeries were performed under general anaesthesia, except for 5 patients that underwent cysphoplasty under local anaesthesia with mild sedation. The mean surgical duration was 1 hour. No intra-operative occurrences were noted for our 45 subjects. Mean blood loss was estimated to be 60 ml, no transfusion was required for patients included in this study. Complications occurred in 20% of the subjects and were: meningeal breach (2 cases), scar infection with good evolution under antibiotics (2 cases), interdiscal leakage and cement anterior (5 cases) without clinical repercussion (Figure 1). It should be noted that none of the material has been removed from our series.

We evaluated the clinical evolution via pre-defined forms to calculate the functional score of the Oswestry Disability Index (ODI); 26 patients had an ODI score between 0 and 20%, 19 had a score between 21% and 40%. We noted that the ODI functional score was higher in patients with work-related accidents or paulytrauma victim. the average length of the sick leave period was 12.47 weeks. Six patients benefited from a professional reclassification justified by associated injuries.

The radiological analysis took into consideration several local and regional parameters: vertebral kyphosis (VK), regional kyphosis, and traumatic regional angulation (ART). The mean lumbar lordosis (LL) for all fractures was 55° (49°-57°). Of the 45 fractures that were treated, the mean preoperative vertebral kyphosis was 13.4° (19°-17°) and the mean preoperative ART was 14.5° (6.6°-15.9°). In the immediate postoperative period, the mean CV decreased to 9.6° (7.9°-11.3°) and the mean corrected ART was 12° (21° - 7°). During the follow-up, an increase in VK was noted at 2-3 months (15.2°), 6-9 months (14.7°) and final (14.2°). The mean postoperative ART decreased in the immediate postoperative period (11.4°) and at 2-3 months (12.3°) compared with the preoperative ART (14.5°).

IV. DISCUSSION

Percutaneous fixation of the lumbar spine was first described by Magerl, who used an external fixator. Subsequently, a first percutaneous lumbar pedicle fixation was described and performed by Mathews and Long. Later, Lowery and Kulkani described a similar technique in which rods were placed. Percutaneous fixation techniques for posterior pedicle screw shafts may be indicated for stable burst or flexion distraction lesions with or without fusion. They do not necessarily require late removal of the implants.

Vertebroplasty was invented by Galibert and Deramond in 1987. It consists in radio-guided injection of polymethylmethacrylate (PMMA) into the weakened part of the vertebral body, for pain relief and/or stabilization purposes. It is performed by introducing the implant into the vertebra through the pedicle, under the control of scopy, by percutaneous way, trocars of various sizes allowing the injection of suitable surgical cement. It was first used for the treatment of painful and aggressive vertebral angiomias. Then the indication was extended in 1989 to the treatment of vertebral compression of tumor or osteoporotic origin. It was until 1997 that the first results of vertebroplasty were published in the United States.

In 1990, Reiley developed kyphoplasty, which is based on the use of an inflatable balloon that is placed at the level of the vertebral body to treat a vertebral collapse in order to restore height. Secondly, the procedure was combined with vertebroplasty. The first results were published in 2001. Kyphoplasty was introduced in France in 2004 by treating a small group of patients in certain centers. The use of polymethylmethacrylate (PMMA) cement in surgery dates back to the early 1960s to fix the hip prosthesis in the femoral shaft. And then, PMMA has been widely used to fill bone cavities or spinal prostheses in several surgical procedures. Non-invasive techniques are becoming more and more numerous and used to replace the so-called "classical" techniques even though they are currently part of the therapeutic armamentarium for the management of non-neurological thoracolumbar fractures of type A2, A3 and B. There is no randomized clinical trial comparing the clinical and functional outcomes of non-invasive techniques with those of conventional techniques. Most of the publications found were retrospective and monocentric, with small population samples. To confirm the observed trend, a multi-site, prospective, randomized study is required. However, our review of the literature revealed a number of benefits attributed to minimally invasive techniques. In addition...
to a smaller incision; the respect of the muscular insertion causing less muscle retraction and better maintenance of muscle tone, which would explain the painless recovery.\textsuperscript{(17,18,20)} According to the literature blood loss is estimated at 50CC for the mini-invasive techniques, against 200 CC in open surgery for the same set-up.\textsuperscript{(19)} An intraoperative transfusion remains exceptional.\textsuperscript{(19,37)}

In 2008, a published study by R. Assaker included 40 subjects with no neurological deficit who were stabilized by posterior percutaneous fixation and followed up for a period of 6 to 28 months with an average of 12 months.\textsuperscript{(8)} These fractures were single-stage fractures, bursting fractures, or bending distraction fractures (AO Types A2, A3, and B1)\textsuperscript{(8)} In the same study, the average time from incision to closure was 75 minutes, the average loss of correction was 7.5\textdegree, no case of infection was identified and no patient was found to require a transfusion.\textsuperscript{(8)} Similarly, according to the data found in the literature, percutaneous pedicle aiming under fluoroscopy, seems to expose the patient to fewer pedicle effractions than the open technique\textsuperscript{(22)} Ringel et al. showed that 87\% of the screws were correctly positioned, 10\% were tolerable, and 3\% were unacceptable, leading to neurological problems and requiring revision by conventional means.\textsuperscript{(22,23)} The rate of malpositioning was highest at the sacral level (40\%).\textsuperscript{(24)} On the other hand, the irradiation rate remains higher in kyphoplasty and vertebroplasty.\textsuperscript{(25)} Rampersaud and A1 showed that the areas most affected were: the hands, the thyroid and the thorax.\textsuperscript{(26)} The dose received decreased by half if the surgeon positioned himself on the other side of the source. The time of exposure to radiation was 5.7 minutes for percutaneous surgery and 3.7 minutes for open surgery.\textsuperscript{(26)} Similar results were found by the team of Schmidt.\textsuperscript{(21)} Since 2007, with the availability of the C-arm 3D, fluoroscopy is no longer useful after the incision.\textsuperscript{(27)} Images are only required before the incision, in the operating room.\textsuperscript{(27)} By means of 3D navigation systems, radiation exposure can be considerably reduced with an increase of the surgical precision.\textsuperscript{(27)} Although there is no consensus, the purpose of removing the hardware is to free the fixed lumbar discs and restore flexibility to the spine after a consolidation period varying from 8 to 12 months depending on the authors. A loss of disc correction may be noted after removal of the hardware, usually without clinical repercussions.\textsuperscript{(26)}

\section*{V Conclusion}

The minimally invasive method has clear advantages as it is less invasive, significantly reduces intra-operative blood loss and lowers the rate of infection. However, its application depends largely on the spinal pathology, the patient's physiognomy, and the surgeon's experience.
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Authors
First Author – Kaoutar Moutaouakil, Neurosurgery Resident, kaoutar.moutaouakil0190@gmail.com
Second Author – Mounir Rghioui, Neurosurgery Fellow, mounir.rghioui@gmail.com.
Third Author – Abdessamad El Azhari, head of department of neurosurgery, Mohammed VI university of health sciences.
Fourth Author – Fadwa Fliyou, Neursurgery Fellow, fadwa.fliyou@gmail.com
Correspondence Author – Moutaouakil Kaoutar, , kaoutar.moutaouakil0190@gmail.com
Community Income from Palm Sugar Processing in Sangtandung Village, Luwu Regency, Indonesia

Witno*, Maria**, Yumna** Dewi Marwati Nuryanti** Ice**

* Forestry of Faculty, Andi Djemma University    ** Forestry of Faculty, Andi Djemma University

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Abstract- Palm sugar or brown sugar is a sweetener made from sap derived from the male flower bunches of the palm tree (Arenga pinnata). The community has felt the role of NTFPs as a source of income, but the processing system is still traditional, so the quality produced is still far from the expected standard, and the price is still low. This study aims to determine the amount of community income from palm sugar processing in Sangtandung Village, Luwu Regency. This research was conducted in August-June 2021 in Sangtandung Village, Luwu Regency, with a sample of 20 palm sugar processors respondents. This study uses direct interviews with selected respondents regarding the equipment and the number of costs used in the manufacture of palm sugar, as well as the amount of palm sugar produced and the amount of money received from the sale of the palm sugar. The result of this research is that the total cost of spending on palm sugar business in Sangtandung Village, North Walenrang District, Luwu Regency is Rp. 33,860,000 with an average expenditure of Rp. 2,636,000/year. The total revenue each year is Rp. 258,500,000 with palm sugar production costing Rp. 2,636,000/year. So it concludes that the average net income received by palm sugar processing farmers is Rp. 12,925,000/year. The average amount spent on palm sugar products is Rp. 2,636,000/year. while for the average income of palm sugar processing farmers, Rp. 10,289,000/year.

Keywords- Palm sugar, NTFPs, Community Income

I. INTRODUCTION

Non-timber forest products are plants that grow inside and outside the forest area. Although the community has felt the role of NTFPs as a source of income, the processing system is still traditional, so the quality produced is still far from the expected standard, and the price is still low [1]. The role of non-timber forest products is from an ecological perspective and an economic and social-cultural aspect. From the financial part, non-timber forest products can be a source of income for the community and the government. Meanwhile, from social culture, the community utilizes and processes non-timber forest products [1]. One of the non-timber product commodities that grow in the Sangtandung village area is the palm tree which grows naturally on the slopes of rivers and mountains. The number of palm trees makes household businesses process sap from palm trees into sugar. The economic value produced by the sugar palm plant can improve the community's economy, especially in the Sangtandung Village area, by utilizing sugar palms as a source of income. Production from palm trees is included in the Non-Timber Forest Products (NTFP) category because it produces starch (carbohydrates), whereas derivatives from palm trees can produce palm flour and sugar. The processing of palm sugar carried out by the people of Sangtandung Village with raw materials derived from palm sap experienced several obstacles, namely the results of erratic palm sap tapping, distribution channels that were still traditional, and no group of palm sugar craftsmen had been formed. In general, palm sugar artisans have side jobs, but in reality, they are more dependent on the business of making palm sugar. An economic basis for the people (rural communities) is appropriate and needs to be developed. In addition, palm sap palm growers are generally concurrently craftsmen who make sugar themselves. In other words, no palm sap farmers sell their sap to palm sugar makers. Because there are many palm sugar artisans, each makes palm sugar traditionally; each artisan is generally static, so there are no ideas to improve the production quality. So the results of sugar production vary from one craftsman to another. Even the production of the same person can differ between the results of one day's show with the next day. Due to its traditional nature, the farmers have not considered looking for alternative markets that buy their sugar products more expensive than the price set by the collectors. In marketing, almost all craftsmen do not know the marketing channels or networks [1]. Until now, nearly no cooperatives or artisan groups have aimed to find alternative markets. The only way to sell their products is to the collectors at a standard price set by the collectors. Sugar palm as a source of income for people living around forest areas has been used for generations. The public utilizes
this commodity to make palm sugar and serve as a source of income. However, the community has not tried it as a business unit. They only use this business as a subsystem to meet their daily needs[2]. Sugar produced from palm sugar processing is very helpful in increasing people's income; so far, the palm sugar industry is still used as a side business, especially by the people of Sangtandung Village. They do not expect too much from the palm sugar industry, considering the income is too little. Because they are also still working in the fields and other jobs to support their family's economic life. Therefore, it is very appropriate if the government, in this case, the Ministry of Industry and Trade, always provides encouragement and motivation to the community, especially the Sangtandung Village community, to improve their welfare through the palm sugar industry they already have. The purpose of the study was to determine the amount of community income from palm sugar processing in Sangtandung Village.

II. LITERATUR REVIEW

A. Non-Timber Forest Products
Non-timber forest products (NTFPs) are plants that grow inside and outside the forest area. Although the community has felt the role of NTFPs as a source of income, the management system is still traditional, so the quality produced is still far from the expected standard, and the price is still low [1]. NTFPs or Non-Timber Forest products have a very strategic value. NTFPs are one of the natural resources that have the advantage of being cooperative and in direct contact with forest communities. Non-timber forest product (NTFP) is the most logical choice because, in protected forest areas, the use of wood is not allowed. The analysis results of the suitability of the location to be rehabilitated are the primary considerations in selecting the kind of NTFPs. However, species that will be developed in the context of rehabilitating protected forests should have other added values, for example, the potential to prevent erosion and landslides. One of the parameters that can be used in this case is the root system [3].

According to Arief that "Forest communities are people who live in and around forests whose livelihoods and environment are largely dependent on the existence of forests and forestry activities [4], in the southeastern archipelagic countries, including Malaysia, India, Myanmar, Laos, Vietnam, the Ryukyu Islands, Taiwan and the Philippines (Hadi, 1991). In Indonesia, sugar palm plants are abundant and spread in almost all parts of the archipelago, especially in humid, hilly areas (Sunanto, 1993), and grow individually or in groups. Sugar palm plants often grow from sea level to an altitude of 1,300 m above sea level. But this plant prefers places with a height of 500-1,200 m (Lutony, 1993) and when cultivated in areas with an altitude of 500-700 m above sea level. Will give satisfactory results (Soeseno, 1992). Soil conditions that are sufficient to nest or carry excess water, such as loose soil, volcanic soil on mountain slopes, and sandy soil around riverbanks are ideal for sugar palm growth. The best environmental temperature is an average of 250°C with an average annual rainfall of 1,200 mm. There are such wide varieties of products that are marketed every day whose raw materials come from palm trees and the demand for these products for domestic and export needs is increasing. Almost all palm tree parts are helpful and can be used for various conditions, including physical parts (leaves, stems, fibres, roots, etc.) and production parts (fruit, sap and starch/flour) of the palm tree is a type of palm plant that produces fruit, liquid and starch or flour in the trunk.

B. Income
1. Understanding Income
According to [5], the amount of income that will be obtained from a farming activity depends on several influencing factors such as land area, production level, entrepreneur identity, planting, and efficient use of labour. Farmers hope to increase their income by carrying out farming activities so that their daily needs can be met [6]. Income can be divided into two, namely farm income and household income. Revenue is a subtraction of revenue from total costs. Household income is income derived from farming activities plus income from activities outside of farming. Farming income is the difference between gross income (output) and production costs (input), calculated per month, year, and growing season. Non-farming income is income earned from doing activities outside of farming, such as trading, motorcycle taxis, etc.

2. Types of Income
a. Farming Income
Farming income, according to [7], can be divided into two meanings, namely (a) gross income, namely all income earned by farmers in farming for one year, which can be calculated from the sale or exchange of production products that are valued in rupiah based on the price per unit of weight at the time of harvesting the results, (b) net income, namely all income earned by farmers in one year reduced by production costs during the production process. Production costs include the real cost of labour and the actual cost of the means of production.

In farming income, two elements are used: the income and expenditure elements of the farming business. Revenue results from multiplying the total number of products with the selling price unit, while expenses or costs are intended as the value of the use of production facilities and others incurred in the production process (Ahmadi, 2001). Production is related to revenue and production costs, and farmers receive the receipts because they still have to be reduced by production costs, namely the overall costs used in the production process [8].

According to Soekartawi (2008) [9], farming costs are all farm expenditures. Farming costs are divided into two, namely fixed costs and variable costs. Fixed costs are costs whose amount does not depend on the product's size, while variable costs are costs whose size is influenced by the production volume.

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b. Fixed Cost (Fixed Cost)
Fixed costs (fixed costs or fixed expenses) are costs that, during a specific operating time range or a certain level of production capacity, are always resolved in number or do not change even though the production volume changes [10]. Meanwhile, (Rosidi & Suherman, 2005) [11] suggests that fixed costs are components of overall fixed costs and will vary per unit with increasing production. The amount of output will be inversely proportional to the cost per unit, so the higher the outcome, the lower the cost per unit.

   a. Variable cost (variable cost)
   Variable costs depend on the number of products and services produced.

b. Average Cost (Average Cost)
The average cost is the total cost of production per unit that has been produced. The average price is calculated by dividing the total cost by the number of products made.

c. Total Cost (Total Cost)
Total costs are costs incurred to produce a finished product that is ready for sale, or total costs are all costs incurred in carrying out production activities or other activities.

f. Household Income
According to [12], a significant benchmark to see the welfare of farmers is household income because some aspects of interest depend on the level of farmers’ income. The payment of the farmer itself will affect the basic needs that must be met, namely, food, clothing, shelter, health and employment. The concept and measurement of the level of community welfare developed and used by several countries always use a multi-dimensional measure [13]. The level of household income is an essential indicator in determining household living. Generally, household income in rural areas does not come from one source but from two or more sources of revenue. The income level is thought to be influenced by the fulfilment of the basic needs of farmer households.

[14] stated that two factors influence the success of farming: internal factors such as soil, water, climate, technology level, management, labour, capital, and the number of workers. In addition to internal factors, there are also external factors, namely the availability of transportation and communication facilities, prices, production facilities, credit facilities, and counselling. Low-income levels require household members to work or try harder to meet their daily needs. Family income is expected to reflect the wealth level, and the number of capital farmers owns. The higher the income of farming families tend to be more willing to take risks. High income reflects the availability of sufficient funds for other farming, and low income causes a decrease in investment and efforts to accumulate capital.

C. Revenue Size
According to Sadono (2010) [8], there are four measures of income:

   a. Farmer's Work Income
   This income is obtained by calculating all income and investment increases which are then reduced by expenditures, both cash and interest on capital and investment in the value of family work.

   b. Family Work Income
   Income derived from remuneration and work, as well as management, carried out by farmers and their members, aimed at increasing household income. Sources of household income are classified into two sectors, namely, the agricultural and non-agricultural sectors. Sources of income from the agricultural sector can be further broken down into payment from farming, livestock, farm labour, renting out land and profit sharing. Sources of income from home industries, trade, employees, services, non-agricultural workers and other agricultural sub-sector workers.

   According to Soeratno (1996), the measure of income used for the level of family welfare is household income obtained from work. Every member of the working-age family in the household will be encouraged to work for the welfare of his family. Several studies show that family members such as wives and children are contributors to various activities, both in household work and earning a living.

   According to Hernanto (2012), farmers' income is allocated for activities:
   1. productive activities, namely to finance their farming activities,
   2. consumptive activities, namely for food, housing, health, education, recreation, and taxes,
   3. investment maintenance, and
   4. investment and savings.

III. RESEARCH METHODS

A. Time and Location of Research
This research was conducted in August-September 2022 in Sangtandung Village, Luwu Regency. The tools used in this research are computers, digital cameras, recorders and writing instruments. The material used in this research is a questionnaire. Primary data were collected through direct interviews with selected respondents regarding the equipment and the number of costs used in making palm sugar as well as the amount of palm sugar produced and the amount of money received from the sale of the palm sugar. Secondary data is data obtained from other parties, not directly obtained by researchers from the research subject. Secondary data that will be used in this study is the general condition of the research location, namely geographical location, area/land climate and socio-economic conditions of the local community. The population in this study were people who processed palm sugar, as many as 20
people. Determination of the sample using the census method, namely, all the population was made as a sample. The respondents in this study were 20 people.

**B. Data Collection Techniques**

Observation is the process of systematically observing and recording any object you want to observe, carried out directly in the field so that the information needed to continue research is obtained. Furthermore, an interview is a conversation between two or more people to get the correct information. Documentation is collecting data by flowing or taking data from records, documentation, and administration following the problem being studied.

**C. Data Analysis**

The data obtained, both primary data and secondary data, were analyzed descriptively and quantitatively. Quantitative descriptive analysis determines people's income from palm sugar processing. Palm sugar farmers' income is calculated using the following formula:

a. Cost:

\[ TC = TFC + TVC \]

Information:

TC = Total Cost (Rp)

TFC = Total Fixed Cost (Rp)

TVC = Total Variable Cost (Rp)

b. Admissions are:

\[ TR = P \times Q \]

Information:

TR = Total Revenue (Rp)

P = Price (Rp)

Q = Production (Kg)

c. Income:

\[ I = TR - TC \]

Information:

Income = I

Revenue = TR

Cost = TC

**IV. RESULT AND DISCUSSION**

**A. Palm Sugar Processing**

1. **Tapping Palm**

The oil tapping activity was started by preparing the necessary tools: ladders, sticks of bunches of wood, knives, special cutters and ropes. Choosing a tree with the male flower Mayang, the characteristics can be seen from the male flower essence that begins to fall, separating the Mayang stalk from the palm fibre leaves and the fallen frond. The male flower stalk is beaten slowly until it releases sap water. After that, the sap water is accommodated into the bamboo. The water that has been adjusted is transferred to the jerry can. On average, wiretapping is carried out twice daily in the morning at 05:00 -07:00 and 4:00-5:00 p.m.

![Figure 1. Tapping Nira Aren](image)

2. **Cooking**

The results of tapping sap in the afternoon are made into sugar water. The consequences of tapping sap in the morning are cooked simultaneously with high and constant fire for approximately 4 to 5 hours. After boiling, the sap water is filtered to separate impurities and white-bubble. Add one tablespoon of granulated sugar; if the sap water starts to thicken, remove the pan from the fireplace and stir...
the sap water while slowly adding mineral water (± litre). Mixing with wood is done for 7-10 minutes so that it quickly cools and the resulting sugar is solid and does not have holes in the middle.

Figure 2. Cooking Sugar Palm Nira Traditionally using a fire stove

3. Molding
The palm sugar moulding process is prepared when the sugar has thickened. The moulds used by the artisans are usually made of coconut shells. Before printing, the shell is first moistened with water so that the sugar to be printed does not stick when removed from the mould.

Figure 3. Palm Sugar moulding

4. Packaging
Prepare the leaves (macaranga sp) (Lingkobong) to pack/wrap the cold sugar.

Figure 4. Palm Sugar Packaging

Table 1. Cost of Palm Sugar Processing in One Year in Sangtandung Village, Luwu Regency.

<table>
<thead>
<tr>
<th>No</th>
<th>Equipment Type</th>
<th>Amount</th>
<th>Amount people</th>
<th>Price(RP) Per unit</th>
<th>Total price (Rp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fixed cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Wok</td>
<td>1</td>
<td>20</td>
<td>600,000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>3</td>
<td>Machete</td>
<td>2</td>
<td>20</td>
<td>175,000</td>
<td>700,000</td>
</tr>
<tr>
<td>4</td>
<td>Bamboo</td>
<td>2</td>
<td>20</td>
<td>10,000</td>
<td>400,000</td>
</tr>
<tr>
<td>5</td>
<td>Talia Rapiah</td>
<td>2</td>
<td>20</td>
<td>25,000</td>
<td>1,000,000</td>
</tr>
<tr>
<td>6</td>
<td>Ax</td>
<td>1</td>
<td>20</td>
<td>150,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>7</td>
<td>Print Tool</td>
<td>30</td>
<td>20</td>
<td>5,000</td>
<td>3,000,000</td>
</tr>
<tr>
<td>8</td>
<td>Jerry can</td>
<td>8</td>
<td>20</td>
<td>10,000</td>
<td>1,600,000</td>
</tr>
<tr>
<td>9</td>
<td>Bucket</td>
<td>3</td>
<td>20</td>
<td>53,000</td>
<td>3,200,000</td>
</tr>
<tr>
<td>10</td>
<td>Filter</td>
<td>2</td>
<td>20</td>
<td>20,000</td>
<td>800,000</td>
</tr>
<tr>
<td>11</td>
<td>Dipper</td>
<td>1</td>
<td>20</td>
<td>15,000</td>
<td>300,000</td>
</tr>
<tr>
<td>12</td>
<td>Basin</td>
<td>1</td>
<td>20</td>
<td>25,000</td>
<td>500,000</td>
</tr>
<tr>
<td>13</td>
<td>Stirrer</td>
<td>1</td>
<td>20</td>
<td>30,000</td>
<td>600,000</td>
</tr>
<tr>
<td>14</td>
<td>Pakola</td>
<td>1</td>
<td>20</td>
<td>15,000</td>
<td>300,000</td>
</tr>
<tr>
<td>15</td>
<td>Bag</td>
<td>1</td>
<td>20</td>
<td>8,000</td>
<td>160,000</td>
</tr>
</tbody>
</table>
The table above shows that the equipment costs included in the fixed expenses used by palm sugar farmers start from the tapping process to produce palm sugar, namely frying pans, machetes, axes and others. By showing the accumulated costs incurred by farmers with a volume or number of farmers 20 people as much as Rp. 33,860,000/year. The average price per person is Rp. 2,418,571/year. The raw materials and transportation costs are included in the list of non-fixed expenses with a total cost of Rp. 18,860,000/year, with an average price per person of Rp. 3,144,000/year. So it can be concluded that the total cost of palm sugar management is Rp. 52,720,000/year.

The costs incurred are used as operational costs to earn income. The net income of the printed sugar business results from receipts from the sale of printed sugar products after deducting the total cost. The price of printed sugar is between Rp. 20,000-25,000 pack. Each farmer's income is 12,925,000 on average per year; there are differences in the payment of each farmer due to different production. This is influenced by the fact that the amount of shell sugar production per day is small because the juice produced is also tiny, indicating that the more the number of products made is less. The price is low, and the total number of recipients producers receive is also getting smaller.

**B. Reception**

Revenue is the amount of money received from the sale of the resulting product, where the product obtained is multiplied by the selling price prevailing at that time. This can be seen in Table 2.

<table>
<thead>
<tr>
<th>Number Respondent</th>
<th>Product (Kg/year)</th>
<th>Unit price (Rp)</th>
<th>Admissions (Rp/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>800</td>
<td>20.000</td>
<td>16,000,000</td>
</tr>
<tr>
<td>2</td>
<td>600</td>
<td>20.000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>3</td>
<td>400</td>
<td>20.000</td>
<td>8,000,000</td>
</tr>
<tr>
<td>4</td>
<td>750</td>
<td>20.000</td>
<td>14,000,000</td>
</tr>
<tr>
<td>5</td>
<td>600</td>
<td>20.000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>6</td>
<td>400</td>
<td>25.000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>7</td>
<td>680</td>
<td>25.000</td>
<td>15,000,000</td>
</tr>
<tr>
<td>8</td>
<td>600</td>
<td>25.000</td>
<td>15,000,000</td>
</tr>
<tr>
<td>9</td>
<td>700</td>
<td>25.000</td>
<td>17,500,000</td>
</tr>
<tr>
<td>10</td>
<td>400</td>
<td>25.000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>11</td>
<td>800</td>
<td>20.000</td>
<td>16,000,000</td>
</tr>
<tr>
<td>12</td>
<td>700</td>
<td>20.000</td>
<td>14,000,000</td>
</tr>
<tr>
<td>13</td>
<td>400</td>
<td>20.000</td>
<td>8,000,000</td>
</tr>
<tr>
<td>14</td>
<td>600</td>
<td>20.000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>15</td>
<td>600</td>
<td>25.000</td>
<td>15,000,000</td>
</tr>
<tr>
<td>16</td>
<td>400</td>
<td>25.000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>17</td>
<td>700</td>
<td>20.000</td>
<td>14,000,000</td>
</tr>
<tr>
<td>18</td>
<td>700</td>
<td>20.000</td>
<td>14,000,000</td>
</tr>
<tr>
<td>19</td>
<td>600</td>
<td>20.000</td>
<td>12,000,000</td>
</tr>
<tr>
<td>20</td>
<td>700</td>
<td>20.000</td>
<td>14,000,000</td>
</tr>
<tr>
<td>Tptal</td>
<td>12,000</td>
<td>258,500.000</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>600</td>
<td>12,925.000</td>
<td></td>
</tr>
</tbody>
</table>
The table above shows that the total revenue is Rp. 258,500,000, with a palm sugar production of 20,000, - 25,000 per pack in a year at the prevailing prices. For the average income of each farmer, as much as Rp. 12,925,000.

C. Revenue
Income is significant because income is the object of sugar palm sap processing activities in Sangtandung Village, Luwu Regency. Income is the amount of money received by each respondent after deducting expenses. For details, see Table 11 below.

<table>
<thead>
<tr>
<th>Total Expenses (Rp/year)</th>
<th>Admissions (Rp/year)</th>
<th>Income (Rp/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Rp. 52,720,000</td>
<td>Rp. 258,500,000</td>
</tr>
<tr>
<td>Average</td>
<td>Rp. 2,636,000/person</td>
<td>Rp. 12,925,000/person</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rp. 10,289,000/person</td>
</tr>
</tbody>
</table>

The table above shows that the average cost is Rp. 10,289,000, - with an average total income of Rp. 12,925,000, - and expenses of Rp. 2,636,000. So the average monthly income is 500,000/person.

IV. CONCLUSION
The conclusion that can be drawn from the results of research conducted in Sangtandung Village, Luwu Regency, is that the total costs incurred by the community in making palm sugar are 52,720,000, with the average cost incurred by each farmer for palm sugar products are 2,636.000/ person. This research suggests that palm sugar business farmers improve their skills in making palm sugar and using processing technology so that the quality of this palm sugar can last a long time. Palm sugar producers should carry out record management regarding all costs incurred and revenues earned. This is done to determine the income made and avoid losses in the palm sugar business.

REFERENCES


IV. CONCLUSION
The conclusion that can be drawn from the results of research conducted in Sangtandung Village, Luwu Regency, is that the total costs incurred by the community in making palm sugar are 52,720,000, with the average cost incurred by each farmer for palm sugar products are 2,636.000/ person. This research suggests that palm sugar business farmers improve their skills in making palm sugar and using processing technology so that the quality of this palm sugar can last a long time. Palm sugar producers should carry out record management regarding all costs incurred and revenues earned. This is done to determine the income made and avoid losses in the palm sugar business.

REFERENCES


AUTHORS
First Author – Witno, Magister, Forestry of faculty, Andi Djemma University and witnosanganna@gmail.com
Second Author – Maria, Magister, Forestry of faculty, Andi Djemma University and mariaforestry@gmail.com
Third Author – Yumna, Doctoral, Forestry of faculty, Andi Djemma University and Yumnaunanda588@gmail.com
Fourth Author- Dewi Marwati Nuryanti, Agriculture of Faculty, Andi Djemma University and dmnuryanti@unanda.ac.id
Fifth Author- Ice, Forestry of faculty, Andi Djemma University and ice@gmail.com
Correspondence Author – Witno, Magister, Forestry of faculty, Andi Djemma University and witnosanganna@gmail.com

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The Compatibility of Reading Formative Assessment Items In English Classrooms With Bloom’s Revised Taxonomy And The 2013 Curriculum

Helda Ana Firliana¹, Puji Astuti², Suwandi³

¹Student of English Department Department of Semarang State University
²Lecture of English Education Department of Semarang State University
³Lecture of English Education Department of Semarang State University

Corresponding e-mail: heldafirliana@gmail.com
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Abstract

Formative assessment is a training for the students to develop their critical thinking and encourage their skills. This study is designed as a qualitative case study. This study used interviews, classroom observation, and document analysis to collect the data. Then, the objective of this study was to know how the formative assessment items for reading skills are compatible with Bloom’s revised taxonomy and the 2013 curriculum. There are two English teachers as participants in this study. Based on the findings, teacher 1 delivered 21 items for the online reading test and 7 items for the offline test. In addition, teacher 2 delivered 25 items for the online test and 10 items for the offline test. Then, the 68 items are identified as LOTS level. They consist of the level of remembering and understanding. In addition, the items are also defined in the factual, conceptual, and procedural knowledge dimensions. This study's findings are expected to benefit English teachers and further researchers.

Key words: Formative assessment, Bloom’s revised taxonomy, 2013 curriculum

INTRODUCTION

The 2013 curriculum is expected to face educational challenges. In addition, one of the 21st-century challenges is improving the quality of the system and outcomes for Education in Indonesia. In improving the quality of education, higher-order thinking skills (HOTS) should be used to support and encourage the students to develop their critical thinking, creative, and problem-solving skill (Amali et al., 2022). The teachers also should use HOTS assessment to achieve the goal of the 2013 curriculum. Nevertheless, conducting the teaching and assessment practice based on the 2013 curriculum that implementing the HOTS assessment is not easy. Assessment is admitted as an essential part of the teaching process. Based on the function, there are two kinds of assessment. One is formative assessment, which can be used daily to maintain the learning progress and evaluate the student’s comprehension.

It relates to Habib (2016), who defined formative assessment as a set of processes consisting of designing goals, providing several questions to evaluate before continuing to the following material, measuring the output of the learning activities, and
giving feedback to the students. According to the definition, formative assessment trains the students and evaluates the teaching method utilized by the teacher. On the other hand, the formative assessment can make the students aware and responsible for their learning process and decide on their learning goals. So, delivering the formative assessments at the HOTS level can encourage the students to have the critical thinking, problem-solving skills, creativity, and activity. Then, they can be familiar with the HOTS formative assessment items, especially for the reading skill.

Reading skills should be mastered by the students in the learning process (Annisah et al., 2019). Lalani and Rodrigues (2012) argue that a reading assessment is conducted to evaluate the progress of the student’s reading skills. Then, the teachers can deliver several questions to check the student’s ability to memorize, understand, analyze, and make meaning of the text. Reading skill is essential to achieve a successful field in any significant (Amali et al., 2022). So, the teacher has a big role in facilitating students in delivering formative assessment items for reading skills that are compatible with the 2013 curriculum. In addition, Bloom’s revised taxonomy can be used in classifying the objective of the assessment practice based on the cognitive level and the knowledge dimension.

According to Anderson et al. (2001), the cognitive level is defined as six: remember, understand, apply, analyze, evaluate, and create. Based on the six cognitive levels, they classify as high-order thinking skills (HOTS) and low-order thinking skills (LOTS). The LOTS level covers the skills of remember, understand, and apply. On the other hand, the HOTS level covers analyze, evaluate, and create skills. The HOTS assessment practices can support the students’ critical thinking skill. Then, the knowledge dimension is divided into four classifications: factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge. The metacognitive process is defined as the higher level that should be used in teaching and assessing the pupils.

Delivering HOTS formative assessment items for reading skills is needed because it can be used as training for the students to have the skill in analyzing, evaluating, and creating a text. Nevertheless, the pre-observation mentioned that there are students who cannot achieve the reading assessment goal. They are poor in knowing and answering the test items at the HOTS level. On the other side, many teachers conduct the reading assessment in HOTS items for the final test, whereas the daily assessment is practiced at the LOTS level. According to the discussion, this study is aimed to analyze the compatibility of the formative assessment items toward Bloom’s revised taxonomy and the 2013 curriculum. This study limited the scope analysis in the test items for reading assessment.

METHOD

Analyzing the quality of the assessment items is needed. Based on the intention of this study, the qualitative case study was conducted to analyze and describe the case in the senior high school 3 Pemalang. The subjects of this study were two English teachers for the eleventh grader. The interview, classroom observation, and document analysis were utilized to collect the data. Bloom’s revised taxonomy rubric was used to measure the documents, such as the reading test items and the syllabus, to know the cognitive level and the knowledge dimension of the assessment used by the teachers. In this study, I was a data collector, observer, interviewer, and data analyzer. The first step was interviewing two English teachers. The interview guideline was utilized to know the manifestation of the formative assessment in reading skills, the 2013 curriculum, and the use of Bloom’s taxonomy. In addition, document analysis and observation were also used to collect and analyze the data based on Bloom’s revised taxonomy. I observed the assessment practice for the two English classes. Then, this study was presented and reported as descriptive qualitative.

RESULTS AND DISCUSSION

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This part presents findings to describe an issue regarding the compatibility of the formative assessment items for reading skills with the 2013 curriculum.

A. The Manifestation of English Formative Assessment of Reading Skill

Based on the findings, the manifestation of the reading assessment formatively covers online and offline assessments. The online assessment is conducted due to COVID – 19 pandemics. Then, the offline assessment is conducted when the teacher asked several questions in the classroom. These questions were intended to know the students’ comprehension, maintain the students being more active and following the class interaction, and evaluate the teaching method used by teachers. The online formative assessments were delivered in multiple choice. Then, the offline assessments were conducted by direct asking and answering questions. Teacher 1 delivered 21 items for the online reading test and 7 items for the offline test. In addition, teacher 2 delivered 25 items for the online test and 10 items for the offline test.

In addition, the classroom observation assumed that the teachers delivered several questions that could be defined as a formative assessment. The questions are mentioned in table 1.

<table>
<thead>
<tr>
<th>Teacher 1:</th>
<th>Teacher 2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- I have shared the link. Have you??</td>
<td>- now we will talk about explanation text. What kind of text?</td>
</tr>
<tr>
<td>- So, what is the explanation text in your opinion based on the book?</td>
<td>- So, what do you think about these tenses?</td>
</tr>
<tr>
<td>- the boy on the back. So, what is explanation text?</td>
<td>- What is the difference between nouns and noun phrases?</td>
</tr>
</tbody>
</table>

The formative assessment is conducted to support the teaching and learning process. Brown (2014) argued that the formative assessment is utilized to evaluate both the students and the teaching method to shape the competencies and skills before continuing the material. Then the teacher’s role is to prepare and facilitate the students with several assessments to encourage students’ creativity, student’s critical thinking, and reading ability.

B. The Manifestation of Bloom’s Revised Taxonomy and the 2013 Curriculum’s Formative Assessment

According to the interview process, Bloom’s revised taxonomy is defined as the level of cognitive dimension in the teaching and learning process. Both teachers 1 and 2 mentioned that Bloom’s revised taxonomy could help them design and plan the assessment’s purpose. The teachers designed the teaching and assessment using LOTS (low-order thinking skill) and HOTS (high-order thinking skill). It is in line with Brown (2004), who argued that Bloom’s taxonomy could be utilized for measuring the cognitive level in assessment practice. The cognitive level consists of remembering, understanding, applying, analyzing, evaluating, and creating.

In addition, the 2013 curriculum is utilized by the teachers as a guide in conducting teaching and assessment practice. The objective of the 2013 curriculum is to encourage and support the teachers and the English classroom to develop their skills, knowledge, and attitude. The rule of the 2013 curriculum is arranged on the Permendikbud No. 36 the year 2018. The rule mentions that the 2013 curriculum is presented in the form of core competence and basic competence. The core competence (KI) consists of KI1, KI2, KI3, and KI4, aimed as a guide, and competence should be achieved at the end of the class.

In addition, the result of the interviews with two English teachers mentioned that the curriculum is good and it can support the students to be active and have critical thinking. However, both teachers 1 and 2 have obstacles in implementing the 2013
curriculum. They mentioned that they needed more time for the English lesson to achieve maximum results. Then, the less motivation of the students makes the teachers try significant efforts and it needs more time allocation.

C. The Compatibility of The Formative Assessment Items of Reading Skills with Bloom’s Revised Taxonomy

Document analysis was used to obtain the data. Then, the document was analyzed by Bloom’s revised taxonomy rubric. The document was consisting an online reading test and several questions during the offline teaching that discussed explanation text material. The finding is presented in figure 1.

Figure 1

Based on figure 1, it can be summarized that the formative assessment for reading skills was conducted in LOTS (lower-order thinking skill). I analyzed the reading assessment that discussed the explanation text. The analysis mentioned that the teachers only designed the reading assessment with the cognitive level to remember and understand. The online assessment is conducted in multiple choice, and the offline assessment is delivered in oral or direct asking and answering. Therefore, the formative assessment for the reading skill was intended to evaluate the student’s knowledge and ask the students to be more active in following the classroom. The analysis of the reading test is presented below.

Cognitive level: Remember

At the cognitive level remember, the students are expected to remember and know the information and the previous materials. It is related to Anderson & Krathwohl (2001), who mentioned that the remember cognitive level means recalling and retrieving part of the long-term memory. According to the items analysis by Bloom’s revised taxonomy table, 34 reading test items were identified at this level. One of the examples is presented below.

Multiple Choice 1

A kite is an object which is made a light material stretched over a frame. Due to its light material a kite will lift off the ground and fly when it is tilted into the wind.

A kite is uses wind to make it fly because it is heavier than air. When wind travels over the surface of the kite, it is split into two streams of air. One stream of the air goes over the kite while the second stream goes under the kite. The upper stream above the kite. The lower stream hits the kite at a shallow angle and creates an area of high pressure. The high-pressure area has a pushing effect while the low-pressure area has a pulling effect. The combination of push and pull can create enough force to lift the kite into the air.

Kites have been known for thousands of years. They are used for military or scientific purposes. Today’s kites are much used for leisure and competition.

1. What media which use by kite to fly?
   a. Water   c. Wind   d. Air
The questions above are designed by teacher 1 and identified as the remember level and factual knowledge. The items above are intended to imply and recall the information after reading the text. Then, the form of the questions is multiple choice. Therefore, the items are identified as lower-order thinking skills.

**Cognitive level: Understand**

The understanding level is still identified at the LOTS level. At this level, the students can have the skills to interpret, compare, classify, summarize, infer, and explain the information and material from the teacher or other sources. Based on the analysis, there are 28 items identified at this level, both in the factual and conceptual knowledge dimensions. The instances of the reading test items are presented below.

### Multiple Choice 2

A natural disaster is a terrible accident, e.g., a great flood, a big fire or an earthquake. It usually causes great suffering and loss of a large sum of money. The casualties are injured or died. Some people are homeless and need medical care.

Flood occur when the water of rivers, lakes, or streams overflow their banks and pour onto the surrounding land. Floods are caused by many different things. Often heavy rainstorms that last for a brief can cause a flood. But not all heavy storms are followed by flooding. If the surrounding land is flat and can absorb the water, no flooding will occur. If, however, the land is hard and rocky, heavy rain cannot be absorbed. Where the banks are low, a river may overflow and flood adjacent lowland.

In many parts of the world flood are caused by tropical storms called hurricanes or typhoons. They bring destructive winds of high speed, torrents of rain, and flooding. When a flood occurs, the destruction to surrounding land can be severe. Whole villages and towns are sometimes swept away by water pouring swiftly over the land. Railroad track blocked and uprooted from their beds. Highways are washed away.

When a building caught fire, the firemen pitched in to help battle the blaze. Before the pumps were invented, people formed bucket caught fire. Standing side by side, they formed a human chain from the fire to nearby well or river. They passed buckets of water from to hand to be poured on the flames. The damage of the fire did depend a great deal on where it happened. In the country or small village, only a single house might burn down. But in crowded cities, fire often destroyed whole blocks and neighborhoods before being controlled.

5. From the text, we can say …

a. The pump is the only tool used by fire fighters now
b. The pump helps people to fight fires more efficiently
c. Fires in big cities are always very big
d. People no longer use buckets to control fire
Based on the test item above, the students are expected to get the point of the text and choose multiple choices. Therefore, this item is identified as the lower-order thinking skill that consists of remembering, understanding, and applying.

D. The Compatibility of Formative Assessment Items for Reading Skills and the 2013 Curriculum

The 2013 curriculum also organizes the assessment system, which mentions that the assessment should build and develop critical thinking, creative, problem-solving, and innovative skills. Susandari et al. (2020) argue that the 2013 curriculum implemented the HOTs, where the students emphasize having abilities to face the 21st century. Then, the curriculum for SMA/SMK/MA or senior high school consists of 4 core competencies described in the syllabus. The analysis is described in the table below.

<table>
<thead>
<tr>
<th></th>
<th>Teacher 1</th>
<th>Teacher 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of the items</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Topic</td>
<td>Explanation text</td>
<td>Explanation text</td>
</tr>
<tr>
<td>The function of the assessment</td>
<td>Understanding, recognizing, recalling</td>
<td>Understanding, recognizing, recalling</td>
</tr>
<tr>
<td>Kind of assessment</td>
<td>Multiple choice</td>
<td>Multiple choice</td>
</tr>
<tr>
<td>The relevance</td>
<td>Compatible</td>
<td>Compatible</td>
</tr>
<tr>
<td>Skill focus</td>
<td>Reading</td>
<td>Reading</td>
</tr>
</tbody>
</table>

Based on the analysis above, it can be concluded that both teachers 1 and 2 are designed and conducted the assessment that compatible with the 2013 curriculum. However, they designed the assessment at the LOTS level because they still used the level of remembering and understanding.

CONCLUSIONS

The findings intended to find the compatibility of the formative assessment items for reading skills with Bloom’s revised taxonomy and the 2013 curriculum. It concluded that the assessment items of reading skill were conducted at the LOTS level where the teachers used remember level and understand level. The analysis focused in the material explanation text. Based on the syllabus, the students are expected to be able to distinguish, understand, and evaluate the social function, text structure, and linguistic elements in the explanation text and apply the knowledge in daily life. The assessment consists of 28 items by teacher 1 and 35 items by teacher 2. In addition, the teachers have several obstacles in conducting the 2013 curriculum, such as the limitation of time and the passive students in following the class activities.

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Financial Literacy and Paying Income Zakat: Moderating Role of Islamic Financial Planning

Nur Wahid1, Endri Endri2*, Muhammad Hashi Zaenal1

1Tazkia Islamic University College, Bogor, Indonesia  
2Universitas Mercu Buana, Jakarta, Indonesia

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Abstract
The potential for collecting zakat funds in Indonesia is very large, but its realization is still small. The low level of financial literacy, corporate support, and Islamic financial planning is the cause of this difference. This study aims to examine the effect of perceived corporate support, Islamic financial planning, and financial literacy on the payment of income zakat. The study was conducted on company employees in paying zakat income which was carried out in a survey of 106 respondents. The data analysis method used Partial Least Square Structural Equation Modeling (PLS-SEM) with SmartPLS software. The empirical findings of the study prove that financial literacy has a significant and positive effect on Islamic financial planning in paying zakat income. Financial literacy does not significantly affect the payment of income zakat directly, but Islamic financial planning mainly involves paying zakat income through intervening variables. Overall shows that the three factors, namely; Perceived corporate support, financial literacy, and Islamic financial planning can explain the amount of change in income Zakat revenue by 63.9 percent. The limited knowledge of planning and Islamic financial literacy needs to be improved so that the optimization of zakat fund collection in Indonesia can be improved.

Keywords: perceived corporate support, Islamic financial planning, income zakat, Indonesia

JEL classification: G53, 021; Z12

INTRODUCTION

The potential for zakat in Indonesia is very prospective, Asfarina et al. (2019) found that the potential for zakat in Indonesia in 2016 ranged from IDR 69.57 trillion (classical fiqh approach) to IDR 216.54 trillion (contemporary fiqh approach). This potential increased to IDR 233.8 trillion in 2019, with the most potential being income zakat income of IDR 139.07 trillion (Puskas BAZNAS, 2020). In practice, Puskas BAZNAS (2020) recorded that the collection of Zakat, Infaq, and Shadaq (ZIS) in 2016 reached IDR 5.12 trillion (property zakat collected IDR 3.74 trillion). This collection is still tiny compared to the potential zakat of IDR 69.57 trillion (5.38% from the classical fiqh approach or only 1.73% from the contemporary fiqh approach).

Several people have researched things that influence a person to pay Zakat. Influencing factors such as subjective norms and attitudes (Bidin et al., 2009); attitudes, descriptive norms and moral norms (Andam & Osman, 2019); attitude and behavior control (Sapinji et al., 2011); social, religious and economic factors (Bakar & Rashid, 2014); priests and religious education (Jaafar et al., 2011); factors of adolescent understanding of zakat and facilities (Tajuddin et al., 2017); attitudes, subjective norms, behavior control, income, education, and knowledge (Huda & Gofur, 2012); Islamic religiosity (Haji-Othman et al., 2018); attitudes, subjective norms, and perceived behavioral controllers (Saragih, 2018); demographic factors such as age, marital status and income (Muthi’ah et al., 2021); perceptions of the capability of zakat institutions, perceptions of government support and religiosity (Farouk et al., 2017); education, income, religious knowledge and belief in LAZ (Dianingtyas, 2011); awareness, willingness to donate, trust in zakat institutions (Doktoralina et al., 2018).

This study examines and analyzes the factors that affect the payment of income zakat. These factors are perceived corporate support by employees as a Muzakkî (donor), Islamic financial planning, and financial literacy. Research on the influence of perceived corporate support as a Muzakkî, who has government support in paying zakat, as researched by (Farouk et al., 2017) and research on using the internet (Tan & Teo, 2000; Indrasari et al., 2022). Furthermore, the practice of Islamic financial planning is still relatively new, and the literature is still limited (Ahmed & Pg-Md-Salleh, 2016; Hidayat et al., 2022). And the financial literacy factor is one of the factors that have a significant effect on financial planning (Noor et al., 2018; Setywati et al., 2018; Indupurnahayu et al., 2022). Financial literacy has a significant effect on financial planning components such as investment (Hsiao...
The writing of the paper is organized into five parts. The first part is an introduction that discusses two things, namely the phenomenon of income zakat payments and gap research. The literature review discusses one by one the research variables and previous studies. The third section describes the methods for testing research hypotheses. Research results and discussion of empirical findings are discussed more comprehensively in the next section. The last part is in the form of conclusions that are included with the limitations of the study and suggestions for future research agendas

1. LITERATURE REVIEW

Zakat, according to language, means to add. Meanwhile, according to Sharia, it is the name for certain assets according to specific ways and given to a particular group of people (Al-Ghazi, 1982). As the third pillar of Islam, Zakat is an obligation for every Muslim who has fulfilled the requirements to pay it. Allah SWT obliges every Muslim who can pay zakat as stated in Quran surah al-Baqarah: 43, and has determined the group who will receive the zakat as stated in at-Taubah: 6. The following hadith of the Prophet Sallallahu ‘Alayhi Wa Sallam:

Ibn Umar RA. narrated, that the Prophet Sallallaahu ‘Alaihi Wa Sallam said: "Islam is built on five: Testifying that there is no god but Allah and Prophet Muhammad is the messenger of Allah, establishing prayer, paying zakat, pilgrimage to the temple, and fasting in the month of Ramadhan." [HR. al-Bukhari-Muslim]

Income zakat is zakah maal. Dr. Yusuf Qardawi initiated this zakah in his book Fiqh Az Zakah. Qardhawi divides income into two parts, namely Kasb al Amal and Mihan al Hurrah. Kasb al Amal is a person who is subject to an individual or company by getting wages, while Mihan al Hurrah is an independent work and has nothing to do with other people. Qardawi also argues that there are two kinds of jobs that make money; the first is work done alone without depending on others, thanks to the skill of the hands and parts, namely Kasb al Amal. Meanwhile, Mihan al Hurrah is an independent work and consents to the group to whom it is paid.

In Islamic financial planning, the concept of income zakat is also known to influence financial planning. IFP is the variable that intervenes because of the findings in the previous research that financial literacy as a variable that affects the payment of income zakat is also known to influence financial planning.

1.1. Perceived Corporate Support

Perceived corporate support can be identified as the primary determinant of employee attitudes to pay income zakat. It is considered a controlling factor as described by Ajzen (2002). By using the approach taken by Ajzen (2002), individuals tend to have a higher level of intention to pay income zakat if they feel that the company, they work for supports this action. Likewise, in the research of Ajzen and Sheikh (2013), the controller reflects a person's perception of the resources, opportunities, and skills needed to perform a behavior. The description of the company's support in question is how an employee views the company's support in providing facilities that help pay income zakat. Research from Farouk et al. (2017), and Tan and Teo (2000) found government support that affects attitudes in acting. The perceived government support is in the form of support, providing facilities, promoting, encouraging, and providing a payment system for paying zakat (Farouk et al., 2017).

1.2. Islamic Financial Planning

The Certified Financial Planner Board of Standards defines financial planning as a collaborative process that helps maximize a client's potential to meet life goals through financial advice that integrates relevant elements of the client's personal and financial circumstances. Ahmed and Salleh (2016) explained that Islamic financial planning (IFP) is financial planning following sharia and aims to achieve al-Falaj. In IFP, compliance with sharia in using financial services by avoiding usury, gharar, and maysir. IFP components include cash flow and liabilities management, Islamic risk management and takaful planning, Islamic investment planning, Zakah administration, and tax planning, Islamic retirement planning, and Islamic estate and waqf planning. Rahman (2015) examines who pays zakat on pension funds, while Arafah and Fathiy (2013) calculate zakat from the income received.

1.3. Financial Literacy

Financial literacy is the knowledge and skills that enable a person to make effective financial decisions (Altman, 2012). According to Servon and Kaestner (2008), financial literacy is a person's ability to understand and utilize financial concepts. Meanwhile, according to Chen (1998), financial literacy is knowledge to manage finances in financial decision-making, including general knowledge of personal finance, savings and loans, insurance, and investment. While the definition of financial literacy, according to the OECD (2019), is knowledge and understanding of financial concepts and risks, skills, motivation, and confidence to apply this knowledge and experience to make effective decisions in various financial contexts. Also, to improve the financial well-being of individuals and society and enables participation in economic life.
This financial literacy includes basic knowledge of money, borrowing, saving/investment, and protection (Huston, 2010). Financial literacy has a significant influence on personal financial planning. Someone with a good level of financial literacy turns out to be more focused on planning their finances (Lusardi & Mitchell, 2008; Setyowati et al., 2018). Financial literacy also has a significant influence on components in financial planning. Several researchers have found the effect of this financial literacy on personal financial planning (Lusardi & Mitchell, 2008; Setyowati et al., 2018), investment (Hsiao & Tsai, 2018; Shahnia et al., 2020), insurance (Dalkilic & Kirkbesoglu, 2015), retirement planning (Lusardi & Mitchell, 2007a). In personal financial planning, income zakat should be an integral part of calculating the outflow of money, so the authors suspect that financial literacy also influences the payment of income zakat.

According to the theory of investment and behavior, perceived corporate support, financial literacy and Islamic financial planning both directly and indirectly can determine efforts to collect zakat on company income. Therefore, by the research objectives, the research hypotheses tested are:

- **H₁**: The perceived corporate support has a positive effect on the payment of income zakat.
- **H₂**: IFP has a positive effect on income zakat payments
- **H₃**: Financial literacy has a positive effect on IFP in paying income zakat
- **H₄**: Financial literacy has a positive effect on income zakat payments

![Figure 1. Conceptual framework](image-url)

2. METHOD

The method was selected to test the proposed hypotheses and explain the impact of the independent variables, including perceived corporate support, Islamic financial planning, and financial literacy, on the dependent variable. Data collection using a questionnaire, Likert scale with intervals of 1-5, with the weighted values include: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The number of data is 130 respondents; 24 respondents are eliminated. So that this study will analyze data from 106 respondents. Perceived corporate support was measured using 4 indicators adapted from Ajzen (2002), Farouk et al. (2017), and Tan and Teo (2000), while Islamic financial planning was measured using 6 indicators adapted from Ahmad et al. (2020). Moreover, financial literacy was measured using 4 indicators adapted from Chen (1998), Huston (2010), and OECD (2019). Zakat income payments were assessed using 6 indicators (Cokrohadisumarto et al., 2020; Saragih, 2018). Analyst model with Partial Least Square – Structural Equation Modeling (PLS-SEM).

3. RESULTS AND DISCUSSION

The demographic characteristics of the respondents are in the following table 1.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Criteria</th>
<th>Total</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>73</td>
<td>68.87%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>33</td>
<td>31.13%</td>
</tr>
<tr>
<td>Age</td>
<td>≤ 25 years</td>
<td>3</td>
<td>2.83%</td>
</tr>
<tr>
<td></td>
<td>25 – 40 years</td>
<td>51</td>
<td>48.11%</td>
</tr>
<tr>
<td></td>
<td>41 – 56 years</td>
<td>52</td>
<td>49.06%</td>
</tr>
</tbody>
</table>

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http://dx.doi.org/10.29322/IJSRP.12.11.2022.p13137  
www.ijsrp.org
Most respondents were male, with a total sample of 63.87%. The age of respondents aged 41 – 56 years is the X-generation (49.06%), the age of 25-40 years as the Y-generation (48.11%), and a few Z-generation (2.83%). Respondents are dominated by highly educated (bachelor 61.32%, master 34.91%). Most respondents are married or have a family of 83.96% and have a high income.

The results of processing the SmartPLS software are as shown in the following picture:

![Figure 2. SEM Model](image)

**Table 2. Construct Validity & Reliability**

<table>
<thead>
<tr>
<th></th>
<th>Cronbach’s Alpha</th>
<th>rho_A</th>
<th>Composite Reliability</th>
<th>Average Variance Extracted (AVE)</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy</td>
<td>0.895</td>
<td>0.907</td>
<td>0.918</td>
<td>0.653</td>
<td>Reliabel &amp; Valid</td>
</tr>
<tr>
<td>Perceived Corporate Support</td>
<td>0.826</td>
<td>0.856</td>
<td>0.884</td>
<td>0.657</td>
<td>Reliabel &amp; Valid</td>
</tr>
<tr>
<td>Islamic Financial Planning</td>
<td>0.791</td>
<td>0.807</td>
<td>0.878</td>
<td>0.706</td>
<td>Reliabel &amp; Valid</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>0.676</td>
<td>0.751</td>
<td>0.800</td>
<td>0.574</td>
<td>Reliabel &amp; Valid</td>
</tr>
<tr>
<td>Zakat Income Payment</td>
<td>0.674</td>
<td>0.698</td>
<td>0.822</td>
<td>0.608</td>
<td>Reliabel &amp; Valid</td>
</tr>
</tbody>
</table>
Table 3. Fornell-Larcker Criterion

<table>
<thead>
<tr>
<th></th>
<th>Zakat Literacy</th>
<th>Perceived Corporate Support</th>
<th>Islamic Financial Planning</th>
<th>Financial Literacy</th>
<th>Zakat Income Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy</td>
<td>0.808</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Corporate Support</td>
<td>0.297</td>
<td>0.811</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islamic Financial Planning</td>
<td>0.358</td>
<td>0.433</td>
<td>0.840</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>0.128</td>
<td>0.292</td>
<td>0.560</td>
<td>0.757</td>
<td></td>
</tr>
<tr>
<td>Zakat Income Payment</td>
<td>0.567</td>
<td>0.663</td>
<td>0.569</td>
<td>0.362</td>
<td>0.780</td>
</tr>
</tbody>
</table>

From the results of the PLS_SEM run, the loading factor > 0.6 (Hair et al., 2019), AVE > 0.5 (Hair et al., 2013, 2019), Fornell-Larcker criterion reflective construct values (Hair et al., 2013). Thus, all latent variables meet the requirements of convergent, reliable, and valid validity.

The structural model analyzes the effect of exogenous variables on endogenous variables by using inner model evaluation. The evaluation of the inner model includes multicollinearity (multicollinearity), predictive relevance (Q2), and determination (R2).

Tabel 4. Inner value VIF

<table>
<thead>
<tr>
<th></th>
<th>Zakat Literacy</th>
<th>Perceived Corporate Support</th>
<th>Islamic Financial Planning</th>
<th>Financial Literacy</th>
<th>Zakat Income Payment</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Corporate Support</td>
<td></td>
<td>1.194</td>
<td></td>
<td></td>
<td></td>
<td>Non collinearity</td>
</tr>
<tr>
<td>Islamic Financial Planning</td>
<td></td>
<td>1.276</td>
<td></td>
<td></td>
<td></td>
<td>Non collinearity</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zakat Income Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The multicollinearity test shows that all variables have an inner VIF value below 5. This result indicates that the model avoids the problem of multicollinearity (multicollinearity). Furthermore, the value of R2 for Islamic financial planning and payment of income zakat are 0.313 and 0.639, respectively. These results indicate that the strength of the model for Islamic financial planning is close to moderate, while the power of the model for payment of income zakat is close to strong (Hair et al., 2019).

Tabel 5. Coefficient of determination (R²)

<table>
<thead>
<tr>
<th></th>
<th>R Square</th>
<th>R Square Adjusted</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Islamic Financial Planning</td>
<td>0.313</td>
<td>0.307</td>
<td>Moderate</td>
</tr>
<tr>
<td>Zakat Income Payment</td>
<td>0.639</td>
<td>0.625</td>
<td>Strong</td>
</tr>
</tbody>
</table>

Path coefficient, the test carried out using the bootstrapping procedure, with the following results:
Table 6. Path Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Original Sample (O)</th>
<th>T Statistic (O/STDEV)</th>
<th>P Values</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy -&gt; Zakat Income Payment</td>
<td>0.349</td>
<td>4.988</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Perceived Corporate Support -&gt; Zakat Income Payment</td>
<td>0.447</td>
<td>6.852</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Islamic Financial Planning -&gt; Zakat Income Payment</td>
<td>0.212</td>
<td>2.405</td>
<td>0.017</td>
<td>Significant</td>
</tr>
<tr>
<td>Financial Literacy -&gt; Islamic Financial Planning</td>
<td>0.560</td>
<td>9.435</td>
<td>0.000</td>
<td>Significant</td>
</tr>
<tr>
<td>Financial Literacy -&gt; Zakat Income Payment</td>
<td>0.067</td>
<td>0.863</td>
<td>0.389</td>
<td>Not Significant</td>
</tr>
</tbody>
</table>

Based on the results of the table above, there is significance in all paths indicated by P-values less than 0.05 and t-statistics values greater than 1.96. However, there is also one path with P-values of 0.389 (greater than 5%) and a t-statistics value of 0.863 (less than 1.96), which is not significant.

Table 7. Total Indirect Effects

<table>
<thead>
<tr>
<th></th>
<th>Original Sample (O)</th>
<th>T Statistic (O/STDEV)</th>
<th>P Values</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy -&gt; Zakat Income Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Corporate Support -&gt; Zakat Income Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islamic Financial Planning -&gt; Zakat Income Payment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Literacy -&gt; Islamic Financial Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial Literacy -&gt; Zakat Income Payment</td>
<td>0.119</td>
<td>2.328</td>
<td>0.020</td>
<td>Significant</td>
</tr>
</tbody>
</table>

From table 6, the financial literacy variable has an indirect effect significantly and positively on the payment of income zakah through IFP of 0.119 with the t-statistics value of 2.328 greater than 1.96 and a significance value (p-value) of 0.020 smaller than 0.05. The IFP variable plays a good role in mediating the effect of financial literacy in paying income zakah (the intervening variable). Furthermore, to assess the prediction accuracy of the PLS path model by calculating the Stone-Geisser Q2 value. This test uses a blindfolding procedure, with the following results:

Table 8. Predictive Relevance

<table>
<thead>
<tr>
<th></th>
<th>SSO</th>
<th>SSE</th>
<th>Q2 (=1-SSE/SSO)</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zakat Literacy</td>
<td>636.000</td>
<td>636.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Corporate Support</td>
<td>424.000</td>
<td>424.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Islamic Financial Planning</td>
<td>318.000</td>
<td>251.639</td>
<td>0.209</td>
<td>Medium</td>
</tr>
<tr>
<td>Financial Literacy</td>
<td>318.000</td>
<td>318.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zakat Income Payment</td>
<td>318.000</td>
<td>200.023</td>
<td>0.371</td>
<td>Strong</td>
</tr>
</tbody>
</table>
The predictive relevance value (Q2) for the endogenous latent variable (inner model) is greater than zero, indicating the path model's predictive relevance for certain constructs. The Q2 value for Islamic financial planning is 0.209, or moderate, and income zakat payments are 0.371 or strongly appropriate (Hair et al., 2013).

All indicators and constructs in this study have met the convergent validity requirements. They have also met discriminant validity criteria, free from multicollinearity. The goodness of the model in this study, by looking at the \( R^2 \) value according to table 5. The \( R^2 \) value as shown in the table is:

- The effect of the financial literacy variable (FLI) on Islamic financial planning (IFP) gives an \( R^2 \) value of 0.313 (close to medium). This value illustrates that the FLI variable has a moderate effect on IFP by 31.3%, and other variables outside this study explain 68.7%.
- Meanwhile, the influence of zakat literacy variables (ZLI), perceived company support (PCS), Islamic financial planning (IFP), and financial literacy (FLI) on income zakah payments (ZIP) gives a value of 0.639 (close to strong). This value illustrates that the variable of the perceived company support, Islamic financial planning together with financial literacy, and financial literacy itself, affects the income zakah payment by 63.9%, and other variables outside this study explain 36.1%.

Furthermore, to measure the prediction accuracy of the PLS path model, it was tested using Q2 Stone-Geisser's test through a blindfolding procedure. From the test results, the Q2 value of Islamic financial planning is 0.209, and the income zakat payment is 0.371 (table 28). This Q2 value indicates that:

- Financial literacy (FLI) has a score of 0.209. This value indicates that the model's prediction accuracy on Islamic financial planning (IFP) in this study is moderate.
- While zakah literacy (ZLI), perceived company support (PCS), financial literacy (FLI), and Islamic financial planning (IFP) resulted in a value of 0.371. This value indicates that the prediction accuracy of the model in this study is substantial (Hair et al., 2013).

Promotion, facilities, encouragement, and support are indicators that meet the requirements of convergent and valid reliability and are free from multicollinearity in this variable. Test results show the t-statistic value of 6.852 (greater than 1.96), then the effect is significant with a p-value of 0.000 (less than 0.05). Refer to the original sample (O) value of 0.447, which indicates that the relationship between perceived company support and income zakat payments is positive. Thus, hypothesis H1 proposed in this study is that the perceived corporate support has a significant and positive effect on the income zakat payment, which is accepted. The stronger the support provided by the company, the more employees pay income zakat. The results are in line with previous research that the role of the government in the form of providing facilities, promoting, encouraging, and providing a payment system affects muzakki in paying zakah (Farouk et al., 2017). The perceived support also from the government involves internet use (Tan & Teo, 2000). This research can be more specific because its scope is more limited to the role of company support felt by employees in paying income zakat.

The company's support felt by TELKOM's employees is indeed very strong. This support is in the form of providing monthly salary deduction facilities to pay income zakat. The company also encourages zakah studies in routine recitations at office mosques, providing place/room facilities for LAZ to conduct socialization and open houses on institutional programs. The company also disseminates information about the distribution of zakah and infaq in Telkom's internal media as a form of transparency in the management of zakat and infaq. Cokrohadisumarto et al. (2020) in their research, found that transparency can help increase the acquisition of zakat collection. Likewise, a study conducted by Jayanto and Munawaroh (2019) related to Muzakki's perception that openness is essential in the form of periodic reports that Baznas must carry out as LAZ. This regular report can increase Muzakki's trust in Baznas and make quality relationships more maintained so that zakah payments through Baznas will continue to be made by muzakki. In this regard, the company as a channel for paying income zakat through salary deductions will still be an employee's choice if they can carry out transparency and periodic reports.

Indicators that meet the requirements of convergent and valid reliability and are free from multicollinearity in this variable are Islamic risk management and insurance and Islamic investment planning. The test results show the t-statistic value of 2.405 (greater than 1.96), then the effect is significant with a p-value of 0.000 (less than 0.05). Refer to the original sample (O) value of 0.212, which indicates that the relationship between Islamic financial planning and the payment of income zakah is positive. Thus, hypothesis H3 proposed in this study, namely Islamic financial planning, has a significant and positive effect on the income zakat payment is accepted. The higher the literacy of Islamic financial planning in employees, the more employees pay income zakat. The results of this study have explored and confirmed the effect of IFP in paying income zakah, as stated by Andam and Osman (2019) and supported by research by Asfarina et al. (2019), which calculates zakah on money received at retirement, and also a study from Arafah and Fathiyy (2013) which calculates zakah from income received. It is essential for every Muslim to do this Islamic financial planning, not only for paying income zakah. But Islamic financial planning is also in managing income (cash flow and expenses) to comply with religious law, doing risk mitigation and Islamic insurance, making Islamic investments, planning Islamic pensions, dividing assets for grants, donations, endowments, and planning inheritance.

Indicators that meet the requirements of convergent and valid reliability and are free from multicollinearity in this variable are insurance, pensions, and investment. The test results show the t-statistic value of 9.453 (greater than 1.96), then the effect is significant with a p-value of 0.000 (less than 0.05). Refer to the original sample (O) value of 0.560, which indicates that the...
relationship between financial literacy and Islamic financial planning is positive. Thus, hypothesis H3 proposed in this study, namely that financial literacy has a significant and positive effect on Islamic financial planning in paying income zakat, is accepted. The financial literacy of employees will encourage employees to carry out Islamic financial planning. The results are in line with a study by Lusardi and Mitchell (2011), who found someone with a higher financial literacy score tended to be more involved in preparing a clear financial plan. Likewise, research on the effect of financial literacy on financial planning was conducted by (Noor et al., 2017; Setyowati et al., 2018).

Although the financial literacy of Telkom's employees is quite good, they still need to improve their financial literacy in personal financial planning. This increase in financial literacy is significant, especially for the X-generation approaching retirement. The unpreparedness of financial literacy in this generation can result in unpreparedness in facing retirement. If you are not ready to face retirement financially, this generation will become a burden for the next generation. If it becomes a burden, this generation who previously become Muzakkî will be lowered in rank and even become zakat Mustahik. So, the efforts to improve financial literacy in this generation X must be a particular concern from the company and LAZ in preparing this generation to remain Muzakkî.

The test results show that the t-statistic value is 0.863 (less than 1.96), then the effect is not significant with a p-value of 0.389 (greater than 0.05). Thus, hypothesis H4 in this study, namely financial literacy, has a substantial and positive effect on the payment of income zakat is rejected. High financial literacy does not automatically directly influence someone to pay income zakah. This finding is different from the OECD (2019), which defines that a person's financial literacy will participate in economic life. A person's understanding of finances (financial literacy) is not necessarily or not related at all to the level of one's faith in Allah Subhanahu Wa Ta’ala. Financial literacy is the guidance of reason (al-'Aql) which is different from spiritual direction (ad-Diin). Intellectual guidance does not necessarily encourage someone to obey the commands of Allah Subhanahu Wa Ta’ala and His Messenger. Still, religious guidance will inspire someone to follow and carry out the orders of Allah Subhanahu Wa Ta’ala and the sunnah of the Messenger of Allah (Sallallahu 'Alayhi wa Sallam). A person's strong faith will encourage him to use himself, time, wealth, and facilities that Allah Subhanahu Wa Ta’ala has given him to get closer to Allah Subhanahu Wa Ta’ala. The relationship with Allah Subhanahu Wa Ta’ala increases (vertical worship - hablum minallah). And in life, it will be better and more beneficial for humans and the environment (horizontal worship - hablum minannas). This result is in line with previous research that faith (religiosity) is influenced by paying the zakat (Bakar & Rashid, 2014; Farouk et al., 2017; Haji-Othman et al., 2018).

![Diagram](image.png)

**Figure 3. IFP as an intervening variable of Financial literacy**

Although financial literacy has no significant effect on paying income zakat directly. Islamic financial planning as an intervening variable has a significant and positive effect on paying income zakat. The test results show the t-statistic value of 2.328 (greater than 1.96) with a p-value of 0.020 (less than 0.05). Refer to the original sample (O) value of 0.119, which indicates the direction of the relationship between financial literacy indirectly, and the payment of income zakat is positive. The employees with higher financial literacy and higher knowledge of Islamic financial planning will encourage to pay income zakat. This result is in line with previous research that financial literacy has a significant effect on components of financial planning. That is the investment (Hsiao & Tsai, 2018; Suryadi et al., 2021), retirement (Kumar et al., 2019a; Lu, 2003; Lusardi & Mitchell, 2007b), and insurance (Dalkilic & Kirkbesoglu, 2015). Thus, efforts to increase the collection of income zakat for Telkom employees by increasing financial literacy and simultaneously increasing the employee understanding of Islamic financial planning.

**CONCLUSION**

This study concludes that perceived company support and Islamic financial planning have a significant and positive effect on the payment of income zakat. Financial literacy has a significant and positive impact on Islamic financial planning in paying income zakat. Financial literacy does not significantly affect paying income zakat directly, but Islamic financial planning especially involves paying income zakat through the intervening variable. This study recommends that companies improve financial literacy and Islamic financial planning for the employees. Secondly, providing income zakat payment facilities with salary deductions, proof of payment of income zakah payments to the employees reports on income zakat funds collected and distributed transparently, and work the same as LAZ to form UPZ in the company. LAZ, as an Amil zakat institution, must proactively improve Islamic financial planning studies for the employees with material on cash flow and expense management according to religious law, risk management and Islamic insurance planning, Islamic investment planning, zakat, and tax planning, Islamic retirement planning, planning inheritance, grants, and waqf, so that their literacy increases and able to pay income zakat continuously. For this purpose, Amil must prepare himself with knowledge of Islamic financial planning to enlighten the employees as muzakkî zakat. Finally, the recommendation is

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to conduct further research by expanding respondents, such as the millennial generation who have entered the working period and the expansion of respondents in private companies.

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Changing Consumer Behaviors Boost Sales: Theoretical Insight for Afghan Investors and Entrepreneurs

Fazal Ahmad Afzali

*Department, Merwais Neka Institute of Higher Education

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Abstract: Consumer behavior is a hot topic in current market and behavior economic research. There are quite good firms in Afghanistan that have good quality product and services but lack of good customers and sales is a big problem for making profit and somehow survival. It is all due to consumer behavior that are easily changed toward new brands and products. Changing consumer behavior toward someone’s product and services is a difficult job but the results are very inspiring. This is a qualitative research work which the data is taken from published books, journals, and verified websites. The main objective of this research is to discover that which strategies worked in the rest of the world in changing consumer behaviors that increased good customers and sales. We believe that the same factors that affected consumer behaviors in other countries will fit into the Afghan firms in terms up making market share, customers and sales. In this regard, at least six changing behavior strategies were successful in different countries such as identifying customer expectation, developing trust, good customer service, providing incentives to customers, business exposure, and good pricing. We found out that this consumer behavior changing strategies to be useful for the Afghan firms too. Therefore, it is clear that customer and its behavior is the same all over the world with a few culture differences, if one of the above strategies can change the behavior of a customer in other countries, it will change in Afghanistan too.

The most important thing is that as long as a customer know your product, its value, reasonable price, and he receive satisfaction, he will buy from you and come back to you.

Short look to the History of Afghan Economy:

The second Aryan Civilization initiated the idea of economy 3200 BP (Before Present) that is called the first economic phase in Afghanistan such that they had changed from nomadic to settled lifestyle. In regards to this, spinning of wool, cutting materials, sewing, domesticating lives tocks, using animals (Camel, Donkey, and Horse) for transportation, and the introduction of writing and literacy were the first products and services done as business activities in that era. The history states that changes in economy have been slow until Ahmad Sha Durani Era but after the fall of Hotaki Era, Ahmad Shah Durani created Afghanistan as a free and powerful nation in terms of socialization and economy. It is worth mentioned that there is not enough data to prove that what specific steps have been done in improving Afghan Economy (Habibi 1967). The long history of Afghan economy tells that Afghanistan focused more on political economy rather than social as well. The 19 century was not only a notable era for economic reform in Afghanistan but also the current fast growing economies countries have also brought more significant changes in their economies and hence they kept the same way but Afghanistan remained back due to the four-decade war despite a few positive changes at the earliest of 19th century.

Until mid-19th century, we witnessed improvements in commercial and trade activities both internally and externally. Despite exports and imports, a number of significant infrastructures were built such as hydraulic power stations, roads and highways, and communication systems. Meanwhile, political and commercial relations were also established with major European and Asian countries. After mid-19th century, Afghanistan was largely self-sufficient and significant exporter of agricultural products (Najeb 2007). In fact, it is very obvious that the Soviet Union invasion and the civil war destroyed everything including the Afghan economy those was developed in the mid-19th century. These includes the destruction of villages, irrigation systems, land and garden, roads, companies, and hydro powers which these destructions were very severe (Liakhvosky 2001). Following the US attack in 2001, there have been significant and rapid improvements in Afghanistan economy. A number of notable activities changed the Afghan economy such as re-establishing Industry, agriculture, export and import, banking, production, services, and further steps in transportation. The country made international commercial relations and made
Consumer Behavior:

Before addressing any other issues regarding change in consumer behavior, it is worth mentioned that introduction on consumer behavior itself is very vital. Consumer behavior takes in purchasing and other consumption activities of buyers who partake in exchange process. In other words, individuals, groups or organization whose acts are done for the purpose of obtaining products, services or other resources. These acts or processes includes the experience, window shopping, comparison shopping, for the purpose of using and getting their ownership (Consumer Behavior 2012). Experts in consumer behavior expressed their ideas and thoughts about understanding the meaning of consumer behavior. For instance, Engel, Blackwell, and Miniard wrote that acts of individuals, those directly involved in obtaining, using, decision process and disposing of goods and services, are consumer behaviors (Blackwell 1986). This definition seems similar to the first one but only decision which becomes and important consumer behavior is added and hence, completes the understanding of consumer behavior as whole. In addition to those, Berkman and Christopher Gilson made it wiser and more exciting. They claimed that consumer behaviors are acts where they are involved in actual or potential use of market items those includes products, services, retail environments, or even ideas. If one compares all the above definitions, the one initiated by Berkman and Christopher Gilson seems complete and more accurate because the ideas as acts of consumer behaviors are also added. So off course, a consumer behavior must not be done only for product, services or decisions, but also for ideas as well. So, one might always ask a question the why these acts are considered consumer behaviors? There are various answers but a short example will make it clear. Suppose, you plan to buy a new 2023 car next year. Before it happens, you will need to take actions such as searching advertisements, brand, company, design, fittings, color, engine type, gas type and expense, warranty, and payment. You have to take these actions because you cannot make a decision without these acts. Hence, these acts are called consumer behaviors.

Types of Consumer Behavior:

Before to return consumer behaviors, it is significant to understand the four broad consumer behaviors which are categorized by behavioral economists long before. If there is less knowledge about a consumer behavior, a change in the behavior is not effective. So, a very short addressing on types of consumer behaviors is must. In general, there are four types of consumer behaviors, such as Complex Buying Behavior, Dissonance-Reducing Buying Behavior, Habitual Buying Behavior, and Variety Seeking Behavior. The classification of consumer behavior is the same all over the world markets, and in Afghanistan we have the same four types of consumer behavior but the only difference is that the number of each type of consumer behavior are different in different countries. For example, Afghans might have more habitual and variety buying behaviors rather than complex and dissonance. It is true that Afghanistan has very weak economy and that is why people buy just goods and services for survival. It is important for Afghan investors, firms, sales experts and retailers to understand and notice the following four types of consumers which are the same in each country.

I. Complex Buying Behavior

Consumers who buy an expensive product, have complex buying behavior because they are extremely involved in purchase decision. It means they take more responsibility in buying that good or service. So, a buyer who is highly involved in buying decision and plans to buy an expensive good or service, this is called complex buying behavior. In this category, consumers do explore more and that is why their behaviors or decision change dramatically because an expensive product or service is very unaccustomed to them. In such buying transaction, there is high risk involved and this is the reason they turn to friends, family, and experts before taking any actions and decisions. In complex buying behavior, each consumer must pass a learning procedure because he needs to change beliefs, attitudes and a purchase choice about the product but it is not easy though. The reason why marketers should have deep knowledge about the product, is that complex buying consumers need understanding of the product or service (Jose 2020). It is for sure that there are such buyers who buy expensive goods or services in Afghanistan such as expensive cars, house, land and other properties. Before buying them, investors or firms experience that they come and go for four or three times, it is because they want to get more information about the product and share this information with family, friends and expert and get consultation from them. In order to better understand the complex buying behavior in Afghanistan, it is important to put one short example here. Suppose a friend of yours plans to buy a small new production firm of shoes for investment, and we know that it is a big decision and involves high risk but he cannot decide soon. So, what he does he do? In order to buy this firm, he refers this to his family, friends, and experts and even he pays to experts. Thus, the behavior will be changed by consulting these group of people.
II. Dissonance Reducing Buying Behavior:
A consumer buys a high price product which is easily available but there are very few differences among brands which gives him low accessibility of choices. Hence, the consumer is highly involved because these are uncommon purchases. In this type of behavior, a consumer will not do more research because he has very few options, limited decision, and forced to buy that product. In this consumer behavior, two situations take place right after the purchase a consumer has made. First, he might be more satisfied because he may think that he made the right decision. Second, he may be dissatisfied because he thinks that this product might not worth the money, I spent on it or he has not gotten enough information about the product before purchasing it. So, in this consumer behavior, either regression or satisfaction happen at great level. Buying car or house insurance will be a good example for this consumer behavior (Clootrack 2022). We have very a smaller number of such consumer buying behaviors because it is mentioned that Afghanistan has very weak economy and people are not able to pay for such products that they are famous brands with high prices. Let’s put an example of wearing in Afghanistan. You might have seen or not that there are very small number of people who wear shoes from Nike, Gucci, Puma, Adidas, Dior, Prada, Fendi, Balmain, and many more in Afghanistan and also, we do not have many stores for these products because there is no good market for them in Afghanistan. It is simple because they cannot afford them or somehow people don not like to wear expensive shoes. So that is why we have only a few buyers who have dissonance consumer behavior.

III. Habitual Buying Behavior: In this behavior, daily goods or services, which have few significant differences and do not need more thoughts or complex decisions, and the consumer has very low involvement, are purchased. In this behavior, it is very easy for consumer to take decision, because he can buy his favorite brands, regularly experienced ones, the one with least costs, or they are just available in the same store. A loaf of bread, salt, sugar, biscuit, toilet paper, and black tea are easy to buy because there is no need to research or consult for them. In this behavior, consumers just go and buy them. This behavior is mostly, influenced by radio, television, print media, and many local advertisings (Open Learn 2022). If we say that 95% of Afghan buyers have habitual consumer behavior, that is true and correct because we mentioned earlier weak economy allows just eat and find shelter. Since this consumer behavior does not need more involvement, that is why that a young boy can decide what to buy in Afghanistan. Culturally, it is true that young boys or even children around 12 do daily shopping for one family because it is not hard and these products are easily available in the market. Almost, each person who lives together with a family, experience this shopping era in his time. This consumer behavior is more important for Afghan retailers because a person can easily change his or her behavior and that is why it is important to return back this behavior by different strategies.

IV. Variety Seeking Buying Behavior:
Consumer seeks variety, meaning they look for different products rather than the used one. Still there is less involvement of the consumer because there are significant differences between the brands and also, he wants to try some new ones. It is a switching and the cost may not be high between brands but it also does not mean he is dissatisfied with old brands but he just likes variety. Someone goes for Dunkin Donut today, but tomorrow he wants to try Starbucks. It is just consumers like variety (Jose 2020). In the nature of Afghans, they always try something new and one reason could be that they have not seen many available products in the markets and the second reason would be that they desire to try new thing or they try to show self-importance for having that products. Truly, we have such consumer buying behavior despite the fact that we have weak economy.

Problem Statement:
In Afghanistan and also in other countries, understanding consumer behavior is the only key to find success for both current and new products and the failure of a product is solely depended on the knowledge of consumer reaction towards products, though it is a very hard to access that reaction. It is believed that retailers, and firms do not read the consumer behavior rather they just think that it is their need and they have to buy if they need. They think that if consumer do not need their product, they do not buy it from others too but it is not true in reality. If they need a product, from whom should they buy such that there are many options in the market. The problem is that Afghan traders cannot make new buyers and even they cannot keep the old ones because simply they do not know how to do it. Consumer behavior is not just central to find new clients but it is also very vital to keep the present customers because the existing customers are the back bone of the company and finding new one is not an easy task therefore it takes time and more marketing investment. If a shopper is happy about your particular product, definitely, he will repeat the purchase or vice versa. Recently, the navigation of consumer behavior is a big obstacle for major companies in Afghanistan and hence they lose their current consumers and off course sales which is not something new because it happened many times in the very short history of businesses maneuver in
Afghanistan. This is now becoming a big challenge for Afghan investors because there are fears and concerns of launching new products into the markets besides other problems in the country. It should be believed that a rapid change in consumer behavior puts big companies in great risk and a strong competition will take place. Some Afghan firms even cannot retain their current customers because they keep changing very easily. They are significant factors that affecting the consumer behaviors and shifting them to other products and service and of course this will be a loss for one firm but an advantage for another. The firms believe that they don’t have enough knowledge about the market and its success and customer needs, perceptions, and preferences. They also call that lack of good management with stakeholders such as customers, suppliers, investors, employees and agents, are also the main bases of consumer behavior changing. One of the most remarkable factors that pushes consumer behavior is the customer service which is not properly done in many representing agencies and that is why many firms lose their current costumers rather to make new ones. Lack of using new technologies, slow communication with market, various prices for products in different stores are also consumer behavior changing elements (Slawomir 2014). The factors mentioned above fit the Afghan consumer buying behavior because if one says that there is very low quality or even no costumer service in Afghanistan, we should agree with him. If one says that firms and retailers do not have knowledge about their consumers, communication with customers and suppliers, or a good management, we should agree with him. These all factors put the Afghan market into a changing status and thus there is always a loss of sales and put the firms into bankruptcy and failure.

There is always a question when something happens and the question is what happens if a consumer changes his behavior? It is very simple to say that one brand company will lose its sales due to costumer shifting but it is also very important to say that the results of this shifting is very disappointing. The firm that loses sales and costumer go through many challenges because it will have less income compared to previous year, and returning that consumer behavior will take time, money and investment in different aspects and gaining that trust is actually very tough mission. For instance, online shopping greatly improves personalized demands, convenience demand, and recognized mind of consumers and hence they are better satisfied (Wang 2015). A change in consumer behavior is one of the noteworthy problems to be solved and many firms that lose both sales and costumers, are trying to solve this problem at their best effort because sales and costumers are their prime source of surviving and generating income. Since, this is very serious problem for the companies, that is why it should be researched and studied for the purpose of finding the applicable solution to this problem in Afghanistan.

In this research study, you will find out that what factors will navigate back consumers to your firm and get back your sales and clients. It will discover that how those changed consumer behaviors will be returned as previous. This will also show that what specific policy implications will fit the answer of the problem.

Research Gap:
One of the first research gaps is that there is no yet a study either quantitative or qualitative that focuses on consumer behavior and the author finds it very interesting to bring something new in Afghan consumer behavior. Next, losing sales due to a change in consumer buying behavior is a very big problem despite the fact that there are other problems for Afghan firms such as insecurity, lack of facilities, weak border management, and no interests of FDI into the country. It is very important to solve this problem by conducting a small research study. Research work on this problem is necessary because launching new products into the Afghan market will not possible if the problem still exists. In this short paper, we will put the applicable policies for firms, investors and retailers to enjoy the expected income via sales.

Objective of the Study:

i. To find out that which factors will return back consumer buying behavior in Afghanistan.

ii. What consumer behavior strategies that worked in other countries will work in Afghanistan too.

iii. Which policies to put into practice to increase sales and revenue

Research Methodology:
This research study is actually a sales increase plan for Afghan firms and investors who believe they face sales decrease in the short history of their investments. This is a qualitative research work which will not use an econometric model rather than just using online sources. We simply use the secondary data from books, journals, research works, data engines, and success stories which brought a change in consumer behaviors. We believe that a factor for returning consumer behavior can work in other less developing countries, may work in Afghanistan too.

Findings and Discussion

i. Identify Costumer Expectations:

The first and important strategy to change the consumer behavior toward your product is to recognize customer expectations, meaning that what will customer receive as a value, service, and benefit after purchasing your product (Van 2015). It is important to have repeated customers because your business without customer is not a business. Identifying customer expectations is very vital because it generates recurrence customers and statistics shows that it costs at least 5 times more money to keep the old customer than getting new one. Understanding your customer
needs and expectation will keep you away from bad competition because you meet their expectations and they will come back, you will make new ones and they will not shift to your competitors around you. On average, if your customer had a bad experience from your goods and service, they will tell 15 people but if he had good experience, he will tell 11 people, so it is significant to keep your business survived. There are several approaches to identify your customer expectations in no time. First, ask them directly via phone call or an email, and this way they will tell their experience about your service and goods. Major firms first ask their customer service team which is another source to be asked because they are in frontline and understand the customer expectations daily because customers give feedback to customer service right after their experience from service and goods. You can also learn more from your social media channels such as Facebook, Twitter, and your website which most of time customer put reviews there either good or negative (Ring Central 2020).

Murat Ismet came with a helpful discovery while studying how meeting customer expectations increase mass customers in mall restaurant in Turkey in 2013. He did a survey and made his work as success story and a case study. He found out that small restaurants who were focusing on identifying customer expectations had an increase in their customer number. This means that if they increased customers, their sales are increased by the same margin too. Murat found out that these firms changed customers behaviors by applying this strategy and they make good sales (Murat 2013). It is believed that this strategy can work in Afghanistan too because we mentioned that customers are mostly similar in their behaviors. The customers want their expectations from your product or service, that is it. It is mandatory for Afghan sellers to know their customer expectations because this is the first strategy to change your customer behavior and this way you will make new customers and keep the old ones. The final result will be an increase in your sales which is your main objective. Understanding customer expectation is not new in Afghanistan but it is not achieved by the Afghan firms. There are very few businesses who follow their customer expectations but the rest are silent. If we ask customers from different firms that how many times they are asked about their experience from a product or service, they will say non. So, it is strongly advised that the Afghan firms put this into consideration that understanding customer expectation is a key to keep their customer, make new ones and an increase sale.

ii. Develop Trust:

Good consumer trust encourages customers to stay with firm because their consumer behavior will not change which will lead to increase in sales. It is very vital that your customers should have faith on your firm that you really provide the right good or service for them based on their preferences. If there is no trust from customers, they will not buy them because they are not sure if you provide the right quality of goods and services to them. If you have their trust, then the customer will have good experience, loyalty and you can hold them for longer period and also you make more clients and more sales because they share everything about goods and services with other friends and family which is a free marketing for your firm. Besides that, evolving trust in a product, brand, or a firm is a noteworthy part of making consumer company affiliation. Mutual communication is one of the core factors evaluating on the level of consumer trust. Also, marketing as a tool of communication that gets a lot of attention and reactions is one noted part of building trust with consumers. Firms take on several energies to make such advertising messages more exciting to beneficiaries and thus pursue new ways to entice customers attention (Bachnik 2018).

Since consumer trust is one of the leading factors of making new customers and retaining the old ones, it is also important to address that how consumer trust is gained by the firms. The most remarkable factor of gaining consumer trust is brand image which is consumer interpretation of your company, its products and services or simply how consumers feel about your firm and how they perceive it. It is mentioned that brand strength, uniqueness and excellence is the key influencer of gaining trust. The better the brand image, the greater the consumer trust and the more sales. Security is another notable determinant of gaining consumer trust which by security, we mean the security of consumer transaction and data and this is always requested and wished by the consumer. If a firm makes good security of transaction and data, a trust is built here and hence consumers stays for long periods with the same firms. Finally perceived risk is also insisted as a negative factor of consumer trust which means that if there is high perceived risk, there will be less or no trust from consumers. By perceived risk, we mean financial risks, physical risks, social risks, and time risk which can change the consumer behavior very easily. So, if a customer feels secure in terms of financial, social, physical, and timing, then he will have trust on your products and firms (Febrina 2020). Furthermore, a brand that has reputation, predictability, and competency have greater positive effects on consumer trust and the trust is built when costumers use the same brand, and have data about it. A good brand reputation meets the certainty of consumers, and it provided fitness to meet customer needs and thus helps to develop consumer trust (Afzal 2010).

Now it is obvious that the consumer trust is a great influencer of increase in customers and also sales, that is why it is much needed to share a few experiences of various sectors who gained consumer trust and increased their sales by changing customer behaviors. A study by Srika and Noam which titles “Consumer Trust in an Internet Store” in US discovered that consumer trust stimulated the online purchase from US merchants and thus more purchase means more sales and costumers (Srika 1999). In a study by IBM, revealed that 20% of customer have consumer trust on food producing companies, 60% of consumers have no trust on some food producing companies (IBM 2013). It is clear that food firms who gained consumer trust have high volume of customers.
and sales comparing to those who do not have consumer trust. Actually, those food producing firms have changed consumer behavior by gaining consumer trust and boosted their sales. Another research work about consumer trust conducted in Indian Food business, has shown that around 41% of customers have consumer trust because those firms have provided detail information about brand, security, health risks and benefits. The rest, had complaints and concerns about food product healthiness and risks (Jamuda 2015). Besides that, Dr. Nischay, Chanda, Ankita, and Kaur have another research experiment that came up with similar inferences. They added that having consumer trust means customer retention and raising sales. They claimed that there is a positive effect between consumer trust and consumer retention. Their research experiment does not specify any specific sectors, countries or businesses which means that consumer trust can help to boost your sales by retaining your firms anywhere and in any business (Chanda 2015). Here, it is important to insist that those firms that have consumer trust, have actually changed consumer behavior by consumer trust and thus they increased sales and costumers. A Research survey shows that Amazon has the highest consumer trust in E-commerce and thus gained the market comparing to other E-commerce such that they various strategies to gain that trust which security and loyalty to its customers. This is also a sign of more customers and sales (Amazon 2017). E-bay retained 165 million active buyers which is also a sign of good consumer trust and they also launched a program name “Authentication” which has further security and confidence for consumers (E-Bay 2017).

Since consumer trust plays an important in boosting sales and retention of customers in many business sectors and many countries, that is why we believe that it will work for Afghan firms as well but the only differences are in the size of business. It should be claimed that Consumer trust either for a small firm or a big firm has the same objective which increase or retain customer and raise your sales. There is no specific data that which percentage of Afghan Firms gained their consumer trust in last 20 years or in their business history. It should be asked that how many firms provided detail information about their product risks either financial or physical. This is also noticed that how many or which firms advertised their brands in terms of security and loyalty. Firms who provide actual information about their product and service risks, and security will retain the old customer and also make new ones and boost their sales. So, it is strongly advised to the Afghan Firms and sellers to gain their consumer trust by providing product information, consumer security, and the risks associated with product, this way this will make customers and sales.

iii. Customer Service:

The next determinant of changing consumer behavior is customer service which also a factor for increasing sales and customers either in providing service or goods. In customer service, there are two parties involving who interacts directly, one a firm representative who is selling, and another a buyer who purchase. The customers that have expectation for a good quality of your goods or service, they also have expectations from your customer service. In a firm or retail shop, frontline employees have crucial role in communicating the values of their goods or service which is because of close contact (Zeithaml, Bitner, and Gremler, 2013). Better and large number of customer-oriented manners, such as good understanding and listening skills lead to more satisfactory perceptions of service quality of customers. These observations and skills of frontline employees’ impact customer valuations and future intents and finally seller performance (Maxham, Netemeyer, and Lichtentein, 2008). The connection between the frontline employees and vendors’ performance provides confidence that the profit fetter commences by hiring the right people, developing people, providing needed support, and keeping the best people to deliver high quality customer service (Heskett 1994). In recent years, customers necessitated accessibility, convenience, and liability in customer service which a technology can assist and serve customers and technology accompanied customer service from face-to-face interactions to telephone and mobile communications (Harris 2010). Customer service becomes a key element to businesses successes in all matters such as success in marketplace, retaining customers and increase sales (Meyer 2014). Besides other factors such as Service quality, product variety, product quality, and perceived value, customer service is the only determinant that gives customer satisfaction and customer loyalty such that make new customers and generates more sales and income (Dr. Emel 2011). It is believed that profit can be gained for customers and firms which is achieved by good customer service. It is true in many circumstances that the final decision by the consumers is not made only on product price but also on better customer service. Customer service is the noted element to survive in the most competed market (Lucie 2010). This is a need for business to have quality customer service to retain its customers and make sales, and a business without a good customer service would lead to fail (Charlene 2016).

Since customer service plays an important role in business success, retaining customers and making sales, that is why it is also important to put some strategies that how a good customer service is improved. First, seeking customer feedback is important because as seller you are supposed to know that what are the needs, experiences, and aching points of your customers. One can do customer feedback by telephone surveys, feedback email forms, and a complaint system. Strong customer service team means hire and train professionals in the right skills such as empathy and patience, good communication skills, and knowledge which lead to a good customer service. The other notable strategy is to use Customer Relationship Management platforms which provides useful insights about customer needs, improves customer interaction and engagement, and your customer can get access to what was promised with them. Leveraging multi-Channel serving is another way to improve customer service. Around 69% of customers buy from brands who provided multi-channel for services such as mobile devices, social media, and self-service (Gaurav 2018).
There are numerous studies and research conducted that how a good customer service increased sales and customers and we put a couple of experiences from them that hopefully will work in Afghanistan because customer service is the same in many countries only cultural differences distinguish them in a few matters. A Lebanese pharmaceuticals company was losing sales for the past six years despite the fact that it has good product quality proved in its history. In conducting this research in 20 local hospitals, the result showed that customers were satisfied with the product quality, price, location but there were issues in sales team meaning that they were not satisfied with customer service, as a result they were losing sales. It has recommended that if this company focus on finishing offer quotations, reply in timely manner, visiting client more often, changing the behavior of customer care department, spending in retaining, increase the satisfaction of clients, lead to an increase in its revenue (Jennifer 2018). Publix is the number one customer service grocery chain in US, it has a huge number of customers and great sales. Costco which a home décor chain, is the second position in good customer service. There are other big and small firms that improved their customer services and made new customers and sales increase, such as IKEA, Trade Joes, Wegman, HubSpot, Shopify, Poll fish, Apple, Rackspace, Google and many more (Claire 2019).

If a good customer service increase sales and make new customers, why it would not do in Afghanistan besides that Afghans culturally like good manner, truth, smile, and their needs to be met. Since a good customer service do work in India, Lebanon, United States, Russia and many more countries, it might work in Afghanistan too. Many of you as buyers have experienced that customer service is very weak and you may have no good experience while buying however their products and services are good quality. Why many good food restaurants lose customers right after their first year of business, why other good quality Afghan produced products have no sales? Retailers have concerns that their customers have changed their behaviors or their customers are shifting to other stores. Because there is a big problem, which there is not a good customer service. You might have experienced that when you bought many products in 5 different stores, nobody would have said hello to you, nobody gave you detail information about the product, nobody called you back on how satisfied are you from their goods or services and nobody gave or showed you their contacts to call them back in case you are happy from their services and goods. Now this is the problem, that customers do not return back to those stores who do not have good customer services in Afghanistan. Your information, good manner, and support affect their buying behavior and hence they will repeat buying from you, and that way you change their consumer behavior, make or retain customers, and finally make sales. It can be an advice for Afghan firms and stores to provide a good customer service and this way they can make sales by retaining their old customers. So, one can argue that good customer service can change consumer behaviors in Afghanistan too.

iv. Provide Incentives:

Incentive could be used in many situations but in sales business, it is something given by the firm or seller that can motivate their customers and prospects to take some specific actions such as purchase and repetition in return. It is one of the most succeeded ways of keeping the current customers and making new. There are many examples of incentives but here we address a few ensuing. For example, price reduction such as “Buy one get one” is one of the most remarkable customer incentives which it motivates customers to buy more and come again and again. Provide samples which is also a good incentive. If it is a food store, a restaurant, and any other businesses, you can provide free samples and this way they will be motivated and buy from you. Bonus product incentive is always helpful because you give them a free product in return of a specific amount sale or products. For instance, buy iPad pro and get free charging case or anything that fits the explanation (Jenny 2013). One thing should be noted that customers want incentive that is relevant to their purchase product or something useful such as buying 100S cosmetics and receives a free cosmetic case. This means that not everything given to customers can be customer incentives.

Giving customer incentives can be an important factor of increasing customers, sales and income. In a survey, 62 percentage of respondents said that customer incentive can improve their opinion on brands. Customer incentives can lead to more expensive and large purchases in terms of quantity. Higher income buyers show interests in incentives and the research showed that after receiving incentives, they buy more items, shopping in different stores that give incentives, buying a different brand that give rewards, and buying more expensive items. When customer incentives are given, then customers think they valuable customers, they will drive to your brand, they will be loyalist, and brand advocates. It is worth mentioned that women are more interested than men in incentive programs because a survey showed that 62% women buy more and expensive items when they receive incentives or rewards. In recent world, 85% of buying decision is made by women and we found out that women prefer more incentives than men (Virtual 2015). So that is why customer incentives is another way of making sales and customers because it affects directly the customer behavior toward your products and brands.

Since the customer incentive programs are very vital and play a crucial role in retaining and increasing customers and sales, we put a few short case studies of those who successfully launched their customer incentive programs and received good returns from them. The IKEA a Swedish company that sells various home furniture, kitchen tools, and different products, has made major success in making new customers by launching a few customer incentives such as free instore coffee, damage protection, special discounts on products. They have 1.6 million US customers. Target a general merchandise retailer in US has celebrated 80 million customers by applying special reward programs such as 5% saving for each customer and a 30 days’ time period for
returning goods for exchange. Starbucks approached 21 million members in 2021 by launching reward program that would allow members to refill on coffee and tea, and discounts to those members who keep coming back to the Starbucks (Stewart 2022).

Although we put samples of very large firms but we believe that these incentive programs do work in very small businesses because an incentive is always a reward for a customer of either a large firm or a small firm and the behavior of a customer is the same in all times. It should be said that a customer buys as long as he is satisfied and receive something in return from buying your or any firm products. This (Incentive) can be true in Afghanistan too because the main objective is to satisfy your customers, give them value, make them special, and provide something in return besides the product he buys, such as discount, free relevant products, membership savings, and many more which is based on the type of product and service. Suppose an Afghan trader has supermarkets in the country that sell general merchandise products. If they launch a reward program that a customer who buys 10 times from the same store will save 3% in cash back each time he buys from our stores. Or he can provide small free drinks either coffee or tea for those customers who visits and buy from their stores. It is for sure that he will make new customers, retain the old customers, increase sales and make good profit comparing to the no reward program in his stores. The rationale behind this is that the firm actually changes the behavior of customers toward his business by launching these rewards programs. Incentive programs are very common in other part of the world but maybe very new in Afghanistan. There is a strong belief that applying such reward programs will better work in Afghan businesses in terms of increasing customers and sales by changing customer behaviors. At this point, it is strongly advised to the Afghan traders to focus on reward programs for the purpose of increasing their sales and customers and this way, they will make it to the mission and vision of their businesses.

v. Business Exposure:

The next important strategy for increasing a firm customers and sales is the exposure of business which is done for changing consumer behavior. The business exposure means that your goods and services must be seen or have great visibility in a competitive market which is a great step for a firm success and survival. The more your company, product, and service are known or heard by the market, the more success the firm will be; however, it is very difficult to have complete status in the market. Recently, traders attempt at their best to make known their firm in the market. There are various reasons why the business exposure is very important for firms or sellers. For example, it will attract more customers into your business because potential buyers will know your company, brand, product or service and the quality what you have to offer them which will lead to attracting more customers, sales, and profits. This will also help in reputation of your business because people will hear and see constantly what you offer, name, and brand and thus it will make a positive association between your business and customers. So, once it happens, higher sales will be expected which is the main objective of the firms. People will trust your business because they know you, your product, service, name and brand and hear the good things about your business, hence, a trust will take place between your business and customers and people will do business with you (Brian 2022).

Numerous experts published many ways to increase business exposure but here we address a few very accepted ways of how to increase your business exposure. First, it is important to conduct street marketing starting from the very close spots of your business locations. A firm specific marketers or employees can print various posters that can be placed on train or bus stations, parks, benches, billboard or any other common areas that seem busy which will lead your business at local scale and close potential buyers will know your brand, product and name. Next, promotional items could be another opportunity to make exposure that includes trade shows, business events, marketing conferences, network gatherings and many more. These promotional items can be different but it depends on the type of business you have. For instance, a fast-food restaurant will have branded water bottles, a homemade sauce or any other things that fit is relevant to the business. Contest marketing is also highly recommended in increasing business exposure which includes photo contest, caption contest, and sweepstakes. In photo contest, a customer or user posts or submit your brand in any social media with your business hashtag, then you select randomly and provide free product or service to him. In caption contest, a user comments positively on your product photo and you select the one with good support and more likes and then giving him or her a free good or service. In sweepstakes, a user tags his or her friends on your product post and you give him or her free good or service. Finally, social media plays an important role in fast speed marketing for your goods or services. Facebook, Instagram, TikTok, and twitter are so remarkable in this regard. There you can post your goods and services, and then reply to users’ comments, complaints, and their suggestions (Shutter 2020).

A few examples of large auto mobile companies will further enhance the importance business exposure. Mercedes Benz plans to launch a pure electric car, called “The Rich Man’s Big Toy” in 2024. Before the car comes to the real market, they already put this car exposure with detailed information and quality. This will be an expensive car and only the rich men can buy it. Now their product has already much exposure and close the deadline, many rich customers will be in line to buy this car. Some customers might be saving money from now on and some will have different plans to buy this car. As result, the company will have good sales and customer at the time or release and thus will make profit (I media 2022). The same is true for Tesla, Toyota, Ford, Audi, Honda and many more famous Auto Mobile producing companies do business exposure or in other words, product exposure via various channels which now adays online exposure has the best results in successful business exposure. It should be noted that it is not only true for very big firms but it is true for even very small businesses. A small business product exposure can give the same
result in sales in-customer increase. As long as you have known product or service in the market, you will have customers and sales.

Focusing back in Afghanistan, it is very necessary for all Afghan firms to do business exposure and for sure it will give very acceptable results in terms of customers and sales increase. One reason could be that the new generation can read and write and are able to use the new technology specially the social media. It is believed that social media is mostly used for fun and social relations but there are people who even do business by these channels. Business exposure is not well and completely done by the firms as much as needed and this is the reason why many new product or services are failed on their first year because they cannot make market for them or in other words, they can find customers. Now, we found out that a business exposure is experienced almost all over the world with better inferences, and it is expected the same in Afghanistan too because your customers just need to know your brand, product or service and information. Once you have your customers know about your product or service, then they are yours and you will have sales and profit with a long-term survival. Once again, it is highly recommended for the Afghan firms to do business exposure and thus make customers and sales by changing their consumer behaviors.

vi. Good Pricing:

The price is the amount a customer pays for a product or service which is important because it governs a firm profit and also survival. There are several pricing strategies which are based in various situations, for instance, markup pricing strategy where companies adding a specific margin after computing product cost such as Walmart. Target return on investment pricing is another strategy which firms add a percentage of return on investment after calculating the product cost such as auto mobile, gas and electric firms. Competitive pricing strategy sets prices based on competitors scale such as food restaurants (Alexandre 2010). Penetrating pricing strategy is the backbone of a business which is also called promotional pricing, involves setting the prices below market or even below product costs. This is done when a new product is launched into the market or a firm wants entry to the market and plans to have more market share for its product or services. There are also a few factors that affect pricing for different firms, for instance, the external image of a firm, geographical location, discounts, and price discrimination (Tanya 2015). Good pricing is very important because it is the only element that produces revenue such that it has direct impacts on the firm’s bottom line and firm’s profit. Good pricing also plays a key role in creating customer value, customer relationship and managing customer relationship. It is also the main determinant of creating attracting new customers, retaining the old, and making reasonable profit and sales (Lisa 2019).

There are exist many ways to set a good price for your product or service but the most noted point is that what type of price do you want to set which is based on the type of business, situation, geography, and product or service history. But here, we will focus on penetration pricing strategy. In penetrating pricing strategy, market analysts set lower prices than the current market and thus aiming to have more market share, and it also breaks down the purchasing behavior of customers. After allocating the product or service costs and determining the current market prices and then setting your product or service price below the market one. The main objective of penetrating price strategy is that it gives fast sales and keeps your competitors away in the market and also selling a very large number of products, therefore making customers, and profit, is the core advantage of penetrating pricing strategy (Sahoum 2019).

It is found out that there are many industries that they use penetration pricing strategy for the purpose of getting large market share and profit. These include streaming companies such T.V, Internet and cable providers, banking institutions, hospitality, grocery stores, airlines, clothing retailers, cell phone providers, online education institutions, and food manufacturing firms. Brodington grocery stores provide 2.99 $ discount (Lower Price) to its regular members. Fastlane internet provider charge lower price in the market for the first year and its revenue increased by 20% in the first six months. Fine Tune Show gives free 30 days access to all programs and then charge 4.99$ monthly. Landlocked Airlines reduces its prices in winter and making good sales. Marriage Style, a wedding clothing firm, provide lower price to those who spend 500$ or more. Finally, Pop Culture, selling carbonated beverage sells its one soda can for .99$. The main objectives of the above-mentioned firms are to gain large market share, make new customers and sales, and make more future profit (Indeed 2021).

We learned that almost each firm or business experienced a good pricing strategy with very good results such as large market share, sales increase and more profit. It should be true in Afghanistan too because those large firms who benefited from good pricing were once small as they are now in Afghanistan. In Afghanistan, we have superstores, telecommunications, grocery stores and many more business that a good pricing strategy will work for their goodness. Why not a penetration pricing strategy will not work in Afghanistan? It is for sure that there are no reasons that it will not work because a customer is always a customer either in Afghanistan or abroad. The behavior of customers is the same in each country. Giving him the same quality product available in the market with a lower price or discount will give mutual benefits to both the customer and the firm. Since a penetration pricing strategy is a successful pricing strategy and it gave good results in terms of sale and customer increase, that is why it will work in Afghanistan too if the firms and sellers just do a real product or service cost analysis and hence, they will make sales and more customers which are the main objectives of their businesses.

Conclusion and Policy Implications

Consumer behavior is one of the key research issues recently in market and economic studies. Changing consumer behavior
toward someone’s product and services is a difficult job but the results are very inspiring. This is a qualitative research work which the data is taken from published books, journals, and verified websites. The main objective of this research is to discover that which strategies worked in the rest of the world in changing consumer behaviors that increased good customers and sales. We believe that the same factors that affected consumer behaviors in other countries will fit into the Afghan firms in terms up making market share, customers and sales. In this regard, at least six changing behavior strategies were successful in different countries such as identifying customer expectation which is the first that affects sales due to making good customer. It means that what will customer receive as a value, service, and benefit after purchasing your product. Identifying customer expectation generates recurrence customers and will keep you away from bad competition. We also found the developing trust brings good relation between the firms and customer which enhances sales and buyers at great level. Customer service was also found vital because the good manners, detailed information about the product and services, and listening to customer carefully, give the confidence to consumer buy your good or service and thus a firm can make good customer and sales. Providing incentives to customers, business exposure, and good pricing have given good results in generating customers and revenue. We found out this consumer behavior changing strategies to be useful for the Afghan firms too. Therefore, it is clear that customer and its behavior is the same all over the world with a few culture differences, if one of the above strategies can change the behavior of a customer in one country, it will change in Afghanistan too. The most important thing is that as long as a customer know your product, its value, reasonable price, and he receive satisfaction, he will buy from you and come back to you.

Since this research study is done mainly for the Afghan firms and sellers, the following a few policies are worth mentioned for application in Afghan firms:

1. Understanding customer expectation is very vital because it will generate new customers and the Afghan firms will make good sales. Social media channels, an email or a phone call for feedback will give you a good understanding of customer expectation. Applying one of them for now, will help you more in staying in the market

2. Developing trust is also important because it brings good relationship between you and the customers and also it connects the firms with the customers. Gaining this trust assists in creating new customers and retaining old customers. Good brand image, security of the customers and perceived risks are important factors of developing trust. It is advised that providing good brand image, information about customer security, and informing consumers about risk either financial or physical will help in gaining this trust.

3. Customer comes an important factor of making sales. Training your first line employees, providing good manners, giving value to customer and informing customers about the product is a customer service. It helps to retain the current customers.

4. Giving customer incentives is remarkable in this study. Giving discounts, or something relevant to the sale product will encourage consumer to buy, especially women. Price reduction, bonus and buy two get one are good options for providing incentives. It belongs to you and your business type that what type of incentive you can provide.

5. Make yourself visible, meaning put your business name everywhere such customers will know you. Business exposure is also very important that brings new customers to your door. It depends on your budget that how much you can expose your business.

6. Finally good pricing is a method to encourage good customers to your stores. There are many types of good pricing for different business but penetration is recommended in Afghanistan and for Afghan firms. Setting a price below market such that it will not be less then product cost, will give you good sales and customers however you will make less profit on one sale.

Reference


Fazal Ahmad Afzali obtained Bachelor Degree in Finance from Afghan American University in 2010 and 2014 respectively and Master of Arts in Economic Governance and Development from OSCE Academy in Bishkek 2017 and 2018 in Kyrgyzstan. He remained as an Assistant Professor in Mirwais Neka Institute of Higher Education in Kandahar Afghanistan since 2014 to 2019. He also added knowledge to research while working for National and International Research Organization (Samuel Hall & IWPS). His preferred expertise are Macroeconomics, Microeconomics and Fiscal Policies development. Email ID: Afzali.fazil@gmail.com, f.afzali@osce-academy.net
Environmental Concern, water and Rabindranath

Mousumi Kundu

Assistant professor of Political Science, East Calcutta Girl’s College, Lake Town, Kolkata-700089

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Abstract- Environment is a very important thing today. Everyone is concerned about environmental degradation. In-fact now every one very much concerned about water scarcity. Day by day the water level fall down with the continues increasing of urbanization, industrialization population growth.

Index Terms- Environment, Environmental degradation, water scarcity.

I. INTRODUCTION

Today environment is a very important thing. Everyone is concerned about environment. Specially water is a very vital thing. Water scarcity a very critical problem in today’s life. All of know us water is known as life but today we do not get proper drinking water. water supply in India has two principle sources, (1) water from rivers and (2) ground water.

Rabindranath Tagore was not only a great writer but also great environment pioneer. Today in the 21st century, we are thinking about environment. Rabindranath Tagore already even a century ago had been thinking about the matter. In 1916 when he was going to Japan, on his was, he saw oil spill over the sea and started thinking about the impact on environment.

II. ENVIRONMENTAL PROBLEM:

Today in the 21st century, we are facing various types of environmental problems like global warming, acid rain, air pollution, urban sprawl, waste disposal, ozone layer depletion, water pollution, water scarcity, climate change etc. Actually, now we are facing the environmental degradation.

Environmental degradation is the disintegration of the earth or deterioration of the environment through consumption of assets, for example, air, water and soil, the destruction of environments and the eradication of wildlife. It is characterized as any change or aggravation to nature’s turf seen to be pernicious or undesirable. Ecological effect or degradation is created by the consolidation of an effectively substantial and expanding human populace, constantly expanding monetary development or per capita fortune and the application of asset exhausting and polluting technology. It occurs when earth’s natural resources are depleted and environment is compromised in the form of extinction of species, pollution in air, water and soil, and rapid growth in population.[1]

This environmental degradation is the highest threat today. The United Nations also focused on the matter. The environmental degradation is a long term ecological effect which affected the whole living and non living components of the earth that live inside it. It also includes the things on which they depend on, like-streams, lakes, and soils.

There are various causes for environment degradation such as Land disturbance, pollution, over pollution, landfills, deforestation, natural causes.

It affects human health. Today maximum people are suffering from pneumonia and asthma. Millions of people are known to have died of due to indirect effects of air pollution.

Biodiversity is very important for maintaining balance of the ecosystem in the form of combating pollution, restoring nutrients, protecting water sources and stabilizing climate. Deforestation, global warming, overpopulation and pollution are few of the major causes for loss of biodiversity.[2]Ozone Layer Depletion is another effect of environmental degradation. Ozone layer protects the earth from the harmful ultraviolet rays.

The chlorofluorocarbons and hydro chlorofluorocarbons in the atmosphere harm the ozone layer. As a result it will pass the harmful radiations to the earth. The environmental damage such as loss of green cover, loss of biodiversity, etc. also makes a deep effect on the Tourism industry.

If we look the water crisis issue from geographical perspective we saw that India is not a water deficit country. India have major rivers like Ganga, Yamunas, Brahmaputra and annual rainfall of 1170 millimeters. But due to various reasons India faces serious water problem. Due to high population, urbanization, industrialization India faces serious water scarcity. India has failed to properly conserved the rivers. The rivers become polluting. Another side India has a very poor storage capacity. Only 6% of rainwater stored on the other hand the developed country stored 250% stored capacity.

India do not have an strong legislation regarding right to water. only the Supreme court try to protect the right to water.

Rabindranath Tagore was the first environmental pioneer. Tagore was very much concerned about the impact of human being on environment. His concern about environment had been started when he was travelling to Japan in 1916. He saw an oil spill at sea. That experience provoked him to write about nature and made an effort to create consciousness among the human beings about nature. We can say that Tagore was an environmental activist. His philosophy about nature is related with sustainable
rural development. The concept of sustainable rural development is correlated to nature and human beings.

A brief Introduction on Tagore life history:
Tagore was born on 7th May 1861. At some time towards the end of the seventeenth century, his forefather had migrated from their native land to Govindpur, one of the three villages which later came to constitute Calcutta. Rabindranath grandfather was Daraknath Thakur who supported the contemporary Rammohan Roy social movement which also known as Bramha Samaj movement. Rabindranath’s father, Devendranath Thakur, also supported the Bramha Samaj’s movement. In order to encourage its spread in 1863, he establish a meditation centre and guest house on some land about 100 miles from Calcutta at a place called ‘Santimketan’ at abode of peace.[3] Rabindranath was the fourteenth child of his parents. His brothers and sisters were poets, musicians, play writers etc.

The context when Rabindranath was born, there create a deep impact on Rabindranath. At that time Iswar Chandra Vidyasagar had trying to reform the position of the women in the society. English as an important language is considered.

Rabindranath could not get any formal schooling. His education was carried out at home through his own personal efforts and with the help of tutor in various subjects. In 1878 when he was 17, he was sent to London by his father to qualify for the Indian civil service, or as a lawyer. Back in India he continued with his personal education and creative writing and music.[4]

Rabindranath concern about Nature:
Rabindranath Thakur considered as humanistic philosopher, his main focus was human being and man’s well beings who reside in the nature. So as a result his attention came on the nature. His philosophy on the environment is related with sustainable rural development.

His experience in the way Japan, he expressed it in his lectures in Japan. This experience provoked him to write about the modern man who likes to be destroying something to create something for themselves. His experience to modern man considered him to the concept that limitless greed of human beings is the chief enemy of nature. Tagore’s play ‘Raktakarabi’ and ‘Mukatadhara’ show how the human beings torture the nature for his personal greed. He also tried to aware people towards nature. In the essay ‘Aranyabata’, he shows how man becomes unrestrained in his actions.

He wrote “The free bird cries, “O my love, let us fly to the wood”.
The caged bird whispers, “come hither, let us both live in the cage”
Says the free bird among birds, “among bars, where is there room to spread one’s wings?”
Alas, cries the cage bird, “should not know where to sit perched in the.”[6]

Tagore feels that human beings are responsible for the environmental problems. He sorted out the measures to adopt and to overcome this in their near future through the poem. The tame bird was in a cage and I pluck you flower. In his poem the tame bird was in a cage. (the gardener, poem no/II), Tagore brings out the plight of a tamed bird. One bird is in the cage and other in the forest. Both of them meet and fall in love.[7]

Here the both the birds are same type but their upbringings are different. One is domesticated bird and other is a free bird.

The free bird cries, “My darling sing the song of the woodlands.
The cage bird says “Alas for me, I know not the song of the woodlands”.

According to Tagore, the cage bird forgot his natural voice. It can imitate its master’s voice which is not useful for her/him because of the greedy nature of human beings. According to Tagore the human being always refuse the natural perspective and adopt their greedy nature of perspective.

Rabindranath also said in his famous poem ‘The Gardener’ that “I plucked your flower, o world
I presented it to my heart and the thorn picked
When the day wanted and it darken, I found that,
The flower had faded, but the pain remained.”

According to Tagore human beings feel plucking of flower his/her own right. He also said that “………………it is beyond your power to make it blossom. Your touch soils, you tear its petals to Pieces and strew them in the dust.”

Rabindranath in his various writings not only blamed the greediness nature of human beings but also focused on the concept that it is a universal problem to save the forest as well as the nature from the human greediness. According to him God or the creator, sent life and also made agreements for nurturing it all round. But our greed supplied the instrument of death. Tagore not only focused the problem but also look for a solution. He was concerned basically about deforestation. In 1926 when Tagore stayed at the heart hospital at Balatonfured, he planted a tree and that was his first attempt tree-planting ceremony. Many people were inspired by the Tagore’s initiative including Indian Prime Minister by planting trees.

Santiniketan is another example of Tagore’s initiative towards protecting the environment as well as the nature. In 1927 at Santiniketan he started an annual tree-planting ceremony (Brikhharopon) program which is really a great example for the whole world towards protecting our nature or the relation between the man and the nature. The ceremony is still celebrated in Santiniketan every year. Classes at Santiniketan, under the shades of trees, were not only romantic but also a deliberate way of bringing students closer to nature.

Tagore also introduced the idea of Halakarshana (tilling land). It is a clarion call to increase the green cover across the deserts through the plantation.[8] He also initiated the concept of celebrating ‘Borshamongol’ where basically we welcome the monsoon season.

The festival of Earth is also coined by the Rabindranath Tagore. These festivals create a mass environmental awareness.

III. CONCLUSION:

Thus the philosophy of Rabindranath Tagore about nature inspired every human being. Even when the environmental movement was not started in the West, Tagore in 1927 started the
festival ‘Brikkharopan’ at Santiniketan which today we are doing ‘gach laga gach bachao’ program. In short his work can be used for raising awareness about the environment.

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AUTHORS
First Author – Mousumi Kundu, Assistant Professor of Political Science, In East Calcutta Girls College, Lake Town, Kolkata 700089. Mail ID: mousumikundu89@gmail.com
Mob: 9073330212
Socio-Economic Status and Peer Influence as Correlate of Juvenile Involvement In Internet Fraud In Delta State, Nigeria

ULO, EDAFE

Department of Sociology
Faculty of Social Science
Delta State University Abraka, Delta State

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Abstract

The study examined socio-economic status and peer influence as correlate of juvenile involvement in internet fraud in Delta state, Nigeria. The research design adopted for the study was the correlational survey design. This was applied through the use of the questionnaire and in-depth interview; the research instrument used for data collection. The questionnaire was administered to sample of 591 respondents and 24 respondents for in-depth interview through the use of multi-stage sampling method that was employed to randomly select respondents. The descriptive statistics and Pearson correlation technique were used to analyze the data obtained from the study. Descriptive statistics was used to analyze the descriptive data comprising the bio-data in frequencies and percentages while the hypotheses were tested using Pearson Product-Moment Correlation (PPMC). The study concluded that there is a very low negative correlation between family socio-economic status and juvenile involvement in internet fraud, and also there is a moderate positive correlation between peer pressure influences and juvenile involvement in internet fraud the lower the level of core family values, the higher the juvenile involvement in internet fraud and vice versa. This was the basis upon which contribution to knowledge and recommendations were put forward for further studies.

Keywords: socio-economic status, peer influence, internet fraud, Juvenile Involvement

INTRODUCTION

Families serve as one of the strongest socializing forces in a person’s life. They help teach children to control unacceptable behavior, to delay gratification, and to respect the rights of others. Conversely, families can also teach children aggressive, antisocial, and violent behaviour. Despite all these, Igba and Usulor (2016) observed that most Nigerian parents have neglected their role of supervising their children. These juvenile are left alone to do as they wish. Some parents feel that hence we are practicing democracy now; the children should be given a wide range of freedom to operate on their own. Due to the harsh economic reality that has plagued the nation, some parents now encourage their children to be involved in antisocial behaviours. Many blame the family for not doing much to inculcate good morals to their children before sending them to the school and world. With the current happening in our society today, the surge of internet fraud among juvenile is on the high. What could be responsible for the aforementioned problem? Are the African family values losing coherence in the face of the current challenge?

In the opinion of Okoro (2010), all these reasons serve to facilitate internet fraud in most of the world. Widespread corruption, harsh economic climate, high underemployment, disregard for the rule of law, lack of transparency and accountability in
governance which are the main causes of cybercrime in most countries of the world. Internet fraud could be associated with two causes which are the primary and secondary. The primary causes include the prevalence of poverty and weak educational system (Bolt, 2008). The secondary cause can be traced to greed, corruption and get rich quick syndrome. The high level of corruption and the spread of poverty are seen as the main causes of internet fraud in Nigeria among juvenile (Ayantokun, 2016). Nigeria is said to be living below the poverty line (below $1 (₦360.50) per day). Over 5 million Nigerian university undergraduates have no hope of what to do when they graduate from the university. Hence they resort to internet fraud as a means of paving ways for tomorrow.

Socio economic status of family may have contributed to juvenile involvement in internet fraud. Remarkably some parents have nothing to offer regarding good morals and sometime encourage their children to make wealth not minding the method of it acquisition. A child from such home learns whatever he/she likes outside the home from peer groups and such learning can be dangerous. Adejoh, Alabi, Adisa and Emezie (2019) reported that 71% of Nigerian households are poor with the halving of this classified as core poor or very poor. About 77% of the urban and 68% of the rural family is considered poor. The Greater majority of the juveniles are poor. The poverty level of the rural people affects the juveniles negatively, and it leads to internet fraud.

Studies abound in juvenile involvement in internet fraud. For instance, Ige (2008) carried out a research on secondary school students perception of incidence of internet crimes among school children in Oyo and Ondo state. The study indicated that secondary school students involvement in internet fraud is not a function of the socio-economic status of their parents, as students from both rich and poor homes engage in the internet fraud. Also the study indicated that students learn internet fraud from their peers in schools (secondary and higher institutions). In addition, the study also concluded that juvenile involvement in internet fraud has no effect in their academic performance as the students high level of cognition being used to perfect the fraud is also being exploited to enhance their academic performance.

Since family socio-economic status maybe a determinant of juvenile involvement in internet fraud, the researcher deemed it necessary to evaluate core family values and juvenile involvement in internet fraud. The family plays an important role in inculcating norms and values within children. These include an understanding of right and wrong, respect, fairness, compassion and responsibility (Mary, 2016). Children learn these values by observing and emulating their parents’ behaviour, and being taught by their parents. Thus, children learn both the importance of these values and the consequences of not observing them. Garner and Stein (1998), posited that failure of parents to inculcate the right values in the children is related to a greater involvement of adolescent in social vices including internet fraud.

Internet fraud particularly among juvenile has continued to gain popularity as many young people are becoming attracted to the act. In fact, many juveniles in cities and rural areas have embraced Internet fraud as a way of life and a means of improving their economic condition, especially as unemployment rate continues to soar. Esiri (2013) who noted that of one of the goals of peer
influence is concordance, and the result of such is conformity to criminal behaviour (such as internet fraud) in delinquent subculture. It supports the assertion of Nsofor (2013) that peer group is an agent of socialization where young people internalise behaviours, the kinds of behaviour, whether good or bad, embraced by a child is contingent upon the characters of the peers. Adejoh, Alabi, Adisa and Emezie (2019) suggest that many young people get initiated into Internet fraud as a result of their interaction with the so-called yahoo-boys and yahoo-girls as well as their own quest to becoming rich and living a flamboyant lifestyle, especially when they compare their standard of living with those of others who are into the fraudulent act. Therefore, it is against this background that the study will evaluate socio-economic status and peer influence as a correlate to internet fraud among juveniles in Delta State.

Statement of the Problem

Despite a largely shared conviction that values matter in family life and human development and behavior, there is an ongoing public debate about which family values matter in influencing prosocial behavior among juveniles (Garner and Stein, 1998). This debate is fueled by national concern over a continued trend of increasing juvenile involvement in internet fraud. Since 1997, many cases have arisen and numerous types of crimes multiplied, and the methods of committing such criminal acts over the Internet have also evolved to a great extent (Adedipe, 2016). In fact, in 2002 alone, the Internet Fraud Compliant Center reported 75,000 complaints, which indicated that cases multiplied greatly in just one year after 2001. The amount of money lost as a result of the scams also grew exponentially in millions of dollars. This clearly indicates that Internet fraud and its evasiveness from law enforcement is a rapidly growing problem.

A mere observation of the way children are treated, given a lot of leverage in contemporary Nigerian societies, compared to those of traditional society, gives one a lot of worries, especially with the advent of this computer or digital age. One wonders, if family values still exist and cherished among homes in the country. Juvenile uses material things that even their parents cannot afford, things such as internet gadgets (phones, laptops and games), clothes, cars and houses (rented) in rural communities and cities, yet they have no jobs or other source of income. My greatest worry is that parents or guidance do little or nothing regarding instilling the right values in them. This brings us to the question? if family value could be a correlate of internet fraud among juveniles.

Internet fraud is definitely one of the biggest problems that Nigeria faces. Internet fraud has permeated the Nigerian society with youths leading the squad. The Economic and Financial Crimes Commission (EFCC) has recorded several arrests and prosecutions of internet fraudsters. Examples of such include the arrest of six “yahoo boys” in Abuja (Daily post, 2018); prosecution of an arrested suspect who attempted to bribe EFCC operatives with 6.9 million Naira (19,140 US dollars), and several other apprehensions and prosecutions in the last one year (EFCC, 2018). As a relatively new form of crime, internet fraud affects a substantially number of people on a daily basis. The effects of internet fraud are often discussed in terms of financial loses while the indirect effects go unnoticed. For instance, the fear and apprehension of many who refrain from engaging in online commerce
as a result of fraudulent activities is undoubtedly an overlooked consequence of internet fraud (Burns, et al., 2004). Just recently, operatives of the Port Harcourt Zonal Office of the Economic and Financial Crimes Commission, EFCC, arrested 11(eleven) suspected fraudsters, in a sting operation covering Rivers and Bayelsa States. They were arrested on Wednesday, April 21, 2021. Their arrest was spurred by discreet surveillance about their suspicious involvement in internet-related fraud.

Items recovered from the suspects include: 21 phones, two Power banks; two PlayStations; two Speakers; one International Passport; four Sim packs; one Laptop, four Automated Teller Machine (ATM) cards and one Lexus RX 350 Sports Utility Vehicle. Also, operatives of the Economic and Financial Crimes Commission, EFCC, Enugu Zonal office, on Thursday January 28, 2021, arrested 30 (Thirty) suspects for various internet-related offences in Enugu. Their arrest at Thinkers Corner Extension, followed actionable intelligence obtained by the Commission on their alleged criminal activities which targeted mostly foreigners.

According to Chaffin, (2004), the primary responsibility of parents is the proper nurturing of children, because the family plays important role in shaping an offspring by providing values and skills that will stay with children in a life time. However, the existing empirical studies have not considered family values as a determinant of juvenile involvement in internet fraud. The purpose of this study is therefore, to fill this gap and further provide empirical data to evaluate socio-economic status and peer influence as a correlate to internet fraud among juveniles in Delta State.

Objectives of the Study

The general objective of this study is to examine socio-economic status and peer influence as a correlate of internet fraud among juveniles in Delta State.

Research Questions

i. Establish the extent of relationship between family socio-economic status and juveniles involvement in internet fraud in Delta State.

ii. Determine the extent of relationship between peer pressure influences and juveniles involvement in internet fraud in Delta State.

Hypotheses

The following hypotheses guided this study:

1. There is no significant relationship between family social economic status and juvenile involvement in internet fraud.
2. There is no significant relationship between peer pressure influences and juvenile involvement in internet fraud in Delta state.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Socio-Economic Status and Juvenile Involvement in Internet Fraud

The rising popularity of internet fraud may not be unconnected to the fact that the Nigerian state is currently experiencing economic imbalance with attendant high rate of unemployment among able-bodied youths, erosion of traditional values of integrity, and quick-money syndrome. The “Yahoo boys” phenomenon in Nigeria have impacted negatively on socioeconomic status of family (Ibrahim, 2016) as it is done mainly for financial gains. Considering the economic situation in the country, it is unlikely that a complete stop will be put to the menace by using the pain-pleasure approach which states that offenders should be punished. Ojedokun and Eraye (2012) suggested that involvement in the internet fraud may or may not necessarily influenced by socioeconomic status of parents as children of the haves and have not have not been equally arrested and prosecuted for involving in the crime. This suggests that if what pushes the poor into committing internet fraud is the monetary gain, children of the rich are being attracted by other factors aside financial gratification. It is on this note that understanding how young people are initiated, and the possible roles of peers and parents become germane.

The traditional African values frown at illegality, especially stealing. The African adage that goes “I will rather become a slave rather than steal”, is a pointer to the fact that in older times, stealing of any sort was unacceptable. But in modern times, crimes such as internet fraud and Internet robbery are pronounced, and proceeds of such crimes are warmly received by the family and other social institutions. The traditional values of integrity, diligence and honour have been replaced by the money. With this erosion of values and concomitant political uncertainty, economic turmoil, high rate of youth unemployment and underemployment, it is unlikely that there will be a complete stop in internet fraud in the country.

Igba, Igba, Nwambam, Nnamani, Egbe and Ogodo (2018) observed that greed is another devastating wind in Nigeria that leads people to criminal activities because many people want to get rich quickly by all means. Socio economic status of family may have contributed to juvenile involvement in internet fraud. Remarkably some parents have nothing to offer regarding good morals and sometime encourage their children to make wealth not minding the method of it acquisition. A child from such home learns whatever he/she likes outside the home from peer groups and such learning can be dangerous. Adejoh, Alabi, Adisa and Emzie (2019) reported that 71% of Nigerian households are poor with the halving of this classified as core poor or very poor. About 77% of the urban and 68% of the rural family is considered poor. The Greater majority of the juveniles are poor. The poverty level of the rural people affects the juveniles negatively, and it leads to internet fraud. Achievement in terms of material wealth has taken a center stage in every facet of our lives, as most juvenile today now want to make it at all cost and with the
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many research indicated that deviant peers had less influence on adolescents who had close relationships with their parents (Coombs, Paulson, and Richardson, 2014).

Atwai (2011) observed that Peer influence and socio-economic factors appear to be the major factors fuelling juvenile involvement in internet fraud such as computer hacking, online investment, identity theft and phishing. Atwai noted that having friends who engage in internet fraud is one of the greatest determinants in whether juveniles will commit internet fraud. In another related study, Holt (2011) administered a scientific survey to 435 students in a Kentucky school district. Study results showed that the biggest predictor that juveniles might engage in internet fraud is peer influence. He also observed that low self-control have both a direct and indirect effect, through other peers offending, on juvenile internet fraud. The study notes that both low socio-economic status and deviant peer associations have been linked, not only to internet fraud violations, but also to committing other crimes. Burton, Evans, Cullen, Olivares, and Dunaway (1999) observed that the younger a youth’s age, the more imprudent behaviour they perpetrate among youths (12-30 years). This observation has implication for internet fraud practices. Age positively correlated with internet fraud, Females were very unlikely to commit internet frauds. Levels of Education have also been determined to be significant in the manifestation of criminal behaviour.

**Studies on Internet Fraud among Juvenile**

Catherine, George and Melissa (2014) examined juvenile and internet fraud occurrence in the United States. The aim of their study was to determine the predictor of internet fraud behavior among juveniles below the age of 18 years. One thousand six hundred and sixty nine high school students were selected for the study and data was collected using a structured questionnaire. The data collected was analyzed using multiple regression. They found that association with deviant peer and lack of self-control contributed to internet fraud behavior among juveniles. They recommended that school management should organize a program to sensitize the students on the punishment with internet fraud, and also cognitive training of self-control should be done to enhance the self-control of the juveniles.

Emma, Andrew, Jacqui and James (2015) conducted a study to examine the experience and effect of internet fraud on victims. Three hundred and fifty three participants were surveyed using online questionnaire. Descriptive statistics was used to analyze data collected, they found that internet fraud has effect on the mental health of the victims; they also found that victims of internet fraud experience high level of psychological distress.

Berry and Bainbridge (2017) examined the relationship between internet fraud victimization and demographic. Hundred people who use internet frequently were surveyed to ascertain their internet fraud experience and determine if any relationship exist between their demographics and victimization. They found that internet fraud experience of internet users varies according to their gender. Female tend to have more experience of internet fraud than male internet users.
Michelle (2018) conducted a study that examined how internet fraud leads to depression among adolescent in United States. He focused on determining the relationship between internet fraud and unhappiness of victims. Four hundred and thirteen students were surveyed and data collected were analyzed using descriptive statistics. He found out that depression is a serious effect of internet fraud among adolescents and having such experience has a psychological effect on the victim.

Bradford (2019) examined cybercrime perpetration among college students in Midwest United States. He focused on ascertaining the characteristics of college students who engage in internet fraud. He found out that internet fraud behavior is associated with students with low self-esteem and female college students appear to have more low self-esteem while low self-esteem is less related to internet fraud among male students.

METHOD

Research Design

The study adopted the correlational survey design. A correlational study focused on examining the relationships among two or more variables.

Population of the Study

The population of Delta State, according to National Bureau of Statistics) is 5,475,139 of which 2,754,993 are males while 2,720,147 are females. The target population being studied is 2,447,8958, who were the juvenile residents aged 18 years and below in the study area (NBS, 2016).

3.3 Sample Size and Sampling Technique

A sample size of 648 was used for this study. This was obtained by using the formula for sample size developed by Yamane (1967), which was equally adopted by Johnson (2018).

\[
n = \frac{N}{1 + Ne^2}
\]

Where; 
- \( n \) = sample size
- \( N \) = target population of study
- \( e \) = error limit (0.04²) or 0.0016
- \( 1 \) = constant

\[
n = \frac{2720147}{1 + 2720147 (0.0016)}
\]

\[
n = \frac{2720147}{1 + 4352.23}
\]
Instrument for Data Collection

The instruments that were used for the study are Questionnaire and In-depth-interview. The results of the questionnaire were used to answer the research questions and to test relevant hypotheses. The questionnaire type was the structured/close-ended and unstructured/open-ended questions. The questionnaire comprised of two sections (A & B). Section “A” contained the sociodemographic information, and section “B” contained questions and views of respondents on juvenile involvement in internet fraud and susceptibility to peer influence questionnaire in Delta State. The instruments are on a five (5) points Likert Scale ranging from Strongly Agree: SA, Agree: A, Disagree: D, Strongly Disagree SD, to Undecided UD.

The in-depth interview guide (I.D.I)/schedule is a qualitative instrument which was used in understanding more detailed and salient issues that are not covered in the questionnaire. The in-depth interview was used to seek information on the respondents’ knowledge and psychological disposition on core family values, and internet fraud. The respondents that were selected purposively for the in-depth interview are peculiar to the researchers’ evaluation suitable for the study.

Validation of Research Instrument

The instruments were both subjected to face and content validation. The researcher presented the draft copies of the questionnaires alongside the in depth interview schedule of the study to the researcher’s thesis supervisor in the Department of Sociology and Psychology, Delta State University Abraka, to ascertain the suitability of the questionnaires for the study. The supervisor made careful scrutiny of the items to ensure their appropriateness and adequacy as well as their relevance, clarity and language expression. His constructive criticism and suggestions for modifying the instruments were affected in an effort to standardize the instrument.

Reliability of Instrument

The reliability of the instrument was established using Cronbach alpha method of internal consistency. The questionnaires was administered to 30 respondents who were not part of the sample. The results were correlated and was subjected to SPSS (Statistical Package for Social Science). The result yielded a correlation coefficient of the following; Susceptibility To Peer Influence Questionnaire 0.82, Internet Fraud Tendency Scale 0.84, and the general reliability of 0.83 as a measure of consistency. This was considered high enough to be used for this study. (Howitt and Cramer, 2014). The Crunbach alpha reliability also confirmed the convergent validity of the tested instrument (Field, 2018).

Method of Data Collection

The researcher administered copies of the instruments through direct delivery method. The researcher with the help of other assistants distributed copies of the questionnaire to the respondents. The researcher and his assistants retrieved the filled and completed copies of the questionnaire at the spot for scoring and analysis.
The in-depth interview was conducted using twenty four (24) selected students to aid the collection of a more qualitative information from those group (respondents). The in-depth interview was conducted and questions were constructed in a manner that enabled respondents provide profound information on the issue.

**Method of Data Analysis**

The statistical package for social sciences (SPSS) version 23 was used for the analysis and was employed also in describing the characteristics of the study population. Descriptive statistic was used in answering the research questions while Pearson Product-Moment Correlation (PPMC) was used to test the hypotheses of the study. Analysis of the qualitative data placed emphasis on the interpretation and description of responses by the interviewees to compliment the quantitative data. To this end, relevant themes were developed for the coding and sorting of the qualitative data.

**PRESENTATION OF RESULTS**

**Research Question 1:** To establish the extent of relationship between family socio-economic status and juveniles involvement in internet fraud in Delta State.

**Table 1: Correlation Coefficient of family socio-economic status and juvenile involvement in internet fraud in Delta State**

<table>
<thead>
<tr>
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<th>Family Monthly Income</th>
<th>Internet Fraud</th>
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<tbody>
<tr>
<td>Family Monthly Income</td>
<td>Pearson Correlation</td>
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<td></td>
<td>Sig. (2-tailed)</td>
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<td>N</td>
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<tr>
<td>Internet Fraud</td>
<td>Pearson Correlation</td>
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<td>Sig. (2-tailed)</td>
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**. Correlation is significant at the 0.05 level (2-tailed).**

The result in Table 1 shows that the correlation coefficient of family socio-economic status and juvenile involvement in internet fraud is -0.289. Thus, there is a very low negative correlation between family socio-economic status and juvenile involvement in internet fraud. This suggests that the higher the level of family socio-economic status, the lower the juvenile involvement in internet fraud and vice versa.

**Research Question 2:** To determine the extent of relationship between peer pressure influences and juveniles involvement in internet fraud in Delta State.
### Table 2: Correlation Coefficient of peer pressure influences and juveniles’ involvement in internet fraud in Delta State

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<th>Peer Pressure</th>
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<td>Peer Pressure</td>
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<td>Pearson Correlation</td>
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<td>Pearson Correlation</td>
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<td>Sig. (2-tailed)</td>
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<td>N</td>
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</table>

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

The result in Table 2 shows that the correlation coefficient of peer pressure influences and juveniles’ involvement in internet fraud is .599. Thus, there is a moderate positive correlation between peer pressure influences and juvenile involvement in internet fraud. This suggests that the higher the level of peer pressure influences, the higher the juvenile involvement in internet fraud.

This is supported by data from in-depth interview with a senior secondary school student who said:

Peer pressure influence is the major factors fuelling juvenile involvement in internet. For instance, if you keep friends who are involved in internet fraud, it will not be easy not to join them. Also, low self-control have both a direct and indirect effect, through other peers offending, on youth cybercrime. This not only applies to internet fraud but also other social vices and crime.

### Test of Hypothesis

The study tested the following hypotheses to find out whether the hypothetical statements is accepted or rejected. The Pearson Product Moment Correlation techniques was used to test the below hypotheses with a significant level 0.05 (P<0.05)
Hypothesis one

Ho: There is no significant relationship between family social economic status and juvenile involvement in internet fraud.

Hi: There is significant relationship between family social economic status and juvenile involvement in internet fraud.

Table 3: Analysis of Pearson Correlation for hypothesis two

<table>
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<th>Family Monthly Income</th>
<th>Internet Fraud</th>
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<tr>
<td>Family Monthly</td>
<td>Pearson Correlation</td>
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<td>Income</td>
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<tr>
<td>Internet Fraud</td>
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**. Correlation is significant at the 0.05 level (2-tailed).

Decision Rule: If the Pearson r calculated value is greater than the Pearson r critical value, reject Ho and accept Hi. At 0.05 level of significance, with a degree of freedom of 590, the critical Pearson r value is 0.195.

Decision: Since the calculated Pearson r value of -0.289 is less than the tabulated value of 0.195, this implies that the null hypothesis is accepted and the alternate hypothesis is rejected.
Hypothesis two
Ho: There is no significant relationship between peer pressure influence and juvenile involvement in internet fraud in Delta state
Hi: There is a significant relationship between peer pressure influence and juvenile involvement in internet fraud in Delta state

Table 4: Analysis of Pearson Correlation for hypothesis three

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<th>Peer Pressure</th>
<th>Internet Fraud</th>
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<tr>
<td>Peer Pressure</td>
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<td>Pearson Correlation</td>
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<td>Internet Fraud</td>
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<tr>
<td>Pearson Correlation</td>
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**. Correlation is significant at the 0.05 level (2-tailed).

Decision Rule: If the Pearson r calculated value is greater than the Pearson r critical value, reject Ho and accept Hi. At 0.05 level of significance, with a degree of freedom of 590, the critical Pearson r value is 0.195.

Decision: Since the calculated Pearson r value of 0.599 is greater than the tabulated value of 0.195, this implies that the null hypothesis is rejected and the alternate hypothesis is accepted.

Discussion of Findings

The result in Table 1 shows a very low negative correlation between family socio-economic status and juvenile involvement in internet fraud. This suggests that the higher the level of family socio-economic status, the lower the juvenile involvement in internet fraud and vice versa. On the other hand, the finding indicates no statistically significant relationship between family social economic status and juvenile involvement in internet fraud. This shows that low level of family income would lead to higher juvenile involvement in internet fraud. This finding is in line with Birckhead (2012) that inability to afford certain basic commodities such as food and clothing, has significantly contributed to juvenile involvement in crime. According to him, areas
with high rates of poverty have correspondingly high rates of juvenile crime. Registered juvenile delinquents are concentrated in urban areas that coincide with low poverty indices, while they are thinly scattered in better residential areas. High concentrations of juvenile delinquents can thus be found in the slums of large cities, associated with extreme levels of poverty, bad housing, overcrowding and a severe lack of recreational facilities.

The result in Table 2 shows a moderate positive correlation between peer pressure influences and juvenile involvement in internet fraud. This suggests that the higher the level of peer pressure influences, the higher the juvenile involvement in internet fraud. On the other hand, there is a statistically significant relationship between peer pressure influence and juvenile involvement in internet fraud in Delta state. This shows that an increase in peer pressure influence would lead to higher juvenile involvement in internet fraud. This finding is in line with Esiri (2013) who noted that of one of the goals of peer influence is concordance, and the result of such is conformity to criminal behaviour (such as internet fraud) in delinquent subculture. It supports the assertion of Nsofor (2013) that peer group is an agent of socialization where young people internalise behaviours, the kinds of behaviour, whether good or bad, embraced by a child is contingent upon the characters of the peers. Adejoh, Alabi, Adisa and Emzie (2019) suggest that many young people get initiated into Internet fraud as a result of their interaction with the so-called yahoo-boys and yahoo-girls as well as their own quest to becoming rich and living a flamboyant lifestyle, especially when they compare their standard of living with those of others who are into the fraudulent act.

Conclusion

The current study sought to explore socio-economic status and peer influence as correlate of juvenile involvement in internet fraud in Delta state. The findings also indicated that peer influence and materialistic values influence juvenile involvement in internet fraud. However, from the various results it is imperative those juveniles who are more susceptible to peer influence, that places high premium for materialism values and are impulsive has greater tendency to perpetuate internet fraud. In some cases, such youths may either be involved in such behaviour or are likely involved in other types of fraudulent conducts. However, the factors identified in this study are not exhaustive as there are still other factors that could predispose the juveniles towards internet fraud. Therefore for an effective control of fraudulent activities among the juvenile particularly on the internet, more research is required to understand the various factors responsible for the increase of such behaviour among them.

Recommendations

Based on the findings of this study, the researcher proposes the following recommendations to guide the government, organizations, institutions and general public in addressing juvenile involvement in internet fraud. The recommendations are:

1. Government should formulate policies to help change socio-economic status of family and curtail the rise of poverty in the society.
2. Media and social media should promote public education on positive Internet usage through the use of media that is, print and electronics.

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**Non-Communicable Disease Unit, Ministry of Health, Sri Lanka
***Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Colombo, Sri Lanka
****Subfertility Unit, Colombo North Teaching Hospital, Ragama, Sri Lanka

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Abstract- Despite the emergence of novel treatment modalities, mortality rates due to ovarian cancer remain high, and its incidence has been rising over the past two decades. Although numerous studies have been conducted in developed countries to evaluate the risk factors associated with ovarian cancer, there is a dearth of such information in the South Asian region, which includes Sri Lanka. Therefore, this study aimed to assess the risk factors contributing to epithelial ovarian cancer among women over the age of 40 years in the district of Colombo, Sri Lanka.

A population-based case-control study was conducted among 91 consecutively selected newly diagnosed patients with epithelial ovarian cancer (EOC) residing in the Colombo district who were identified from tertiary care hospitals, versus systematically selected 377 community controls with no ovarian masses. A pre-tested, judgmentally validated interviewer-administered risk assessment questionnaire targeting reproductive, genetic, and lifestyle-related risk factors, which was supplemented by a questionnaire on lifestyle and physical activity levels validated for Sri Lanka was used. Unconditional Multiple Logistic Regression was performed in the analysis. The risk factors associated with epithelial ovarian cancer were: being educated beyond G.C.E (O/L) (AOR=4.2, 95% CI:2.0-9.0), being employed at some point in life (Adjusted Odds Ratio (AOR)=2.3, 95% CI:1.1-4.8), age ≥50years (AOR= 2.6, 95% CI:1.2-5.3), being menopausal (AOR=5.1, 95% CI:2.4-10.8), positive family history of breast/ovary/colon cancer in a first-degree relative (AOR=10.2, 95% CI:3.7-28.6), exposure to abdominal X-rays (AOR=3.4, 95% CI:1.2-9.8). On the other hand, having irregular menstrual cycles (AOR=0.4, 95% CI:0.2-0.9), breastfeeding ≥ 24 months (AOR=0.1, 95% CI:0.06-0.4), and taking oral contraceptive pills (OCP) for ≥2years (AOR=0.1, 95% CI: 0.03-0.3) were found to be protective against EOC. Both modifiable and non-modifiable risk factors related to reproductive and genetic domains contribute to epithelial ovarian cancers.

Index Terms- Epithelial ovarian cancers, risk factors, case-control study, Sri Lanka

I. INTRODUCTION

While being the third commonest gynecological cancer and the sixth most common cancer among females in Sri Lanka\(^1\), ovarian cancer is also rated at fourth place among the top ten cancers with the highest mortality rates\(^2\). One in every 131 Lankan females is at risk of developing ovarian cancer during her lifetime, with an age-adjusted incidence of 5.7/100,000 female population\(^1\), and an estimated 5-year prevalence of 5.5 % (n=1828)\(^3\). Although the incidence of ovarian cancer in Sri Lanka had remained stable from 1995-2010, the mortality rates increased between 2003 and 2010 among the older age groups\(^4\).
Epithelial ovarian cancer (EOC) is the commonest ovarian cancer, accounting for 90-95% of all ovarian malignancies\(^5\). They are often detected at advanced stages, and hence the prognosis is usually poor\(^6\). The other ovarian cancer types are germ cell, sex cord-stromal, metastatic and miscellaneous. The mechanism of ovarian cancer development is explained in the literature using two theories: the “incessant ovulation” theory and the theory of “elevated gonadotropin levels”. During the ovulatory process, there could be repeated damage and subsequent repairing of the surface epithelium of the ovary leading to DNA damage resulting in an increased risk for ovarian cancer development\(^7\). In the instances where there is exposure to high levels of circulating pituitary gonadotropins, the stimulation of ovarian surface epithelium would increase the risk of malignant changes\(^8\).

Unlike other malignancies, only a few factors are known to contribute to EOC. These are related to reproductive function, hormonal, genetic, and environmental factors. Among these, the best-known risk factors are advanced age and the presence of susceptibility genes such as BRCA1 and BRCA2\(^9\).

Several epidemiological studies have examined the association between reproductive factors and the risk of EOC. While some of the observational studies have reported an inconsistent association between the age at menarche and ovarian cancer risk\(^10\), a meta-analyses had shown an inverse association\(^11, 12\). Lengthy irregular menstrual cycles have been found to be a protective factor for EOC\(^13, 14\).

Nulliparity exposes the woman to a greater number of ovulatory cycles, thereby increasing the risk of ovarian cancer\(^15-17\). Conversely, increasing parity with decreasing ovarian cancer risk has been observed in a number of studies, conducted in different settings, including Europe, United States of America, and Asia\(^18-20\). An inverse association between EOC risk and breastfeeding for a longer duration was reported in a number of studies\(^21, 22\). Inconsistent associations were reported for women who had attained menopause after 50 years of age in some studies\(^17, 23, 24\). Exogenous hormonal factors such as oral contraceptive pill (OCP) and hormone replacement therapy have been studied in relation to EOC, where a protective effect that increases with the duration of the OCP usage, lasting for at least 15–20 years after the cessation of its use has been noted\(^21, 25-27\).

Studies on lifestyle-related factors such as obesity, smoking, alcohol, diet, and their relationship with EOC risk have reported inconsistent results. Although a number of studies have been conducted in developed countries to elucidate the risk factors attributable to EOC, there is a scarcity of such information from the South Asian region including Sri Lanka. The impact of already known risk factors could vary across the different regions of the world\(^28\). Hence, information related not only to the influence of known risk factors whose impact may differ due to the genetic make-up and the lifestyle of the Lankan women, but also about possible unexplored risk factors for ovarian cancers is urgently required in the local setting. Keeping this in mind the present study was conducted to determine the risk factors attributed to EOC in women over 40 years of age in the district of Colombo, Sri Lanka.

II. METHODS AND MATERIALS

A population-based case-control study was designed, and cases were selected from Gynae-oncology unit of the National cancer hospital, Maharagama, and all the other tertiary care hospitals in the district of Colombo, Sri Lanka between 02nd October 2016 to 31st January 2019. Women who were scheduled for an explorative laparotomy on the suspicion of an ovarian tumor were also requested to participate in the study. Histologically confirmed, newly diagnosed (within at least 3 months) patients with an EOC of any stage (according to FIGO staging), who were over 40 years of age, residing in the district of Colombo for a period not less than one year were recruited as cases. Patients with germ-cell, sex cord-stromal, Kruckenberg tumours, patients with ovarian cancer recurrences or other gynaecological malignancies, and those who were mentally and physically not fit enough to give informed consent (e.g. under intensive care) were excluded from this study. Using probability proportionate to cluster sampling technique, females over 40 years of age, residing in the district of Colombo, Sri Lanka for a time exceeding one year, who were confirmed to be free of an abnormal ovarian mass by the ultrasound scan assessment were selected as controls. Women who had been diagnosed with any other gynaecological malignancy were excluded. A final sample of 96 cases and 383 controls were recruited based on a standard formula. In order to increase the statistical
power, four controls were selected per case from the same Divisional Secretariat division of residence of the case or from the closest Divisional Secretariat division. A pre-tested interviewer administered risk assessment tool measuring the reproductive, genetic and lifestyle factors evaluated for judgmental validity, and a lifestyle physical activity questionnaire (LTPAQ) validated for breast cancer patients in Sri Lanka\textsuperscript{(29)}, were used to collect data. Anthropometric measurements were taken according to standard protocols. Inter-rater reliability for risk assessment tool, and the LTPAQ was assessed using the same sample of subjects. The life event calendar was used in all the interviews. Informed consent was obtained prior to the interviews. Due ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Colombo, Sri Lanka.

The information of the study variables were as follows; Age at recruitment (40-49 years, 50-59 years, 60-69 years, and $\geq$70 years) civil status (married, unmarried, widow, separated), ethnicity (Sinhala, Tamil, Muslim, Burgher,) employment status (unemployed, ever employed, currently employed), level of education (No school education, Grade 1-5, Grade 6-10, G.C.E O/L, G.C.E A/L, technical education and University education and beyond), the age at menarche ($\leq$11 years, $>11$ years), parity (Parous, Nulliparous), regularity of menstrual cycles (regular periods $\leq$ 35 days, irregular periods (lengthy cycles)$>36$ days), the duration of breastfeeding (Breastfeeding not done, breast feeding$\leq$24 months, $>24$ months), the age at menopause ($<55$ years, $\geq55$years) and the duration of exposure to Oral Contraceptive Pills (OCP) (Not used, $<$2years, $\geq2$years), any family history of ovarian/ breast/colorectal cancers among first degree relatives (Yes, No), exposure to passive smoking (Yes, No), occupational activities (low, moderate, high), household activities (low, moderate, high) and Waist to Hip Ratio($<0.86$, $\geq0.86$). Each explanatory variable was re-categorized into 2 categories to be used for univariate analysis followed by multivariate analyses.

### III. STATISTICAL ANALYSES

The data analysis was done using SPSS 22.0 version. The reliability of the study instruments was checked using Cohen Kappa coefficient. Chi-square test was deployed to assess the statistical significance of categorical data, while the t-test was used in relation for quantitative data. Data were analyzed for descriptive statistics, and associations were assessed using univariate logistic regression followed by multiple logistic regression. The independent variables for the multiple logistic regression model were selected based on a p-value of less than 0.25 originating from the univariate analysis. Thirty-nine variables that were found to have p values less than 0.25 and other biologically important variables were selected for the multiple logistic regression. Variables associated with ovarian cancer at a significant level below 0.05 were kept in the multivariate model following purposeful selection. Possible interactions were checked by adding 2 variables at a time, including interaction term into the LR analysis. Multicollinearity was assessed at each step when adding or deleting a variable by using a correlation matrix.

### IV. RESULTS

In total, 91 cases and 377 controls were included in the final analysis giving rise to a 93.8% and 98.4% response rate for cases and controls, respectively. The mean age of the cases was 56.64 years (SD+ 9.35 years), whereas the mean age of the controls was 51.8 years (SD+ 8.34 years).

A greater proportion of both cases and controls were over 50 years of age, and were married, Sinhalese, educated beyond ordinary level examination, and were skilled workers and non-manual workers (table number 1).
<table>
<thead>
<tr>
<th>Socio-demographic characteristic</th>
<th>Cases (%)</th>
<th>Controls (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49 years</td>
<td>23(25.3%)</td>
<td>167(44.3%)</td>
</tr>
<tr>
<td>50-59 years</td>
<td>29(31.9%)</td>
<td>149(39.5%)</td>
</tr>
<tr>
<td>60-69 years</td>
<td>32(35.2%)</td>
<td>45(11.9%)</td>
</tr>
<tr>
<td>&gt;70 years</td>
<td>7(7.7%)</td>
<td>16(4.2%)</td>
</tr>
<tr>
<td><strong>Civil status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>62(68.1%)</td>
<td>341(90.5%)</td>
</tr>
<tr>
<td>Unmarried</td>
<td>19(20.9%)</td>
<td>26(6.9%)</td>
</tr>
<tr>
<td>Divorced</td>
<td>1(1.1%)</td>
<td>4(1.1%)</td>
</tr>
<tr>
<td>Widow</td>
<td>9(9.9%)</td>
<td>6(1.6%)</td>
</tr>
<tr>
<td><strong>Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sinhala</td>
<td>79(86.8%)</td>
<td>332(88.1%)</td>
</tr>
<tr>
<td>Tamil</td>
<td>5(5.5%)</td>
<td>30(7.9%)</td>
</tr>
<tr>
<td>Muslim</td>
<td>7(7.7%)</td>
<td>11(2.9%)</td>
</tr>
<tr>
<td>Burgher</td>
<td>0(0%)</td>
<td>4(1.1%)</td>
</tr>
<tr>
<td><strong>Level of education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No school education</td>
<td>6(6.6%)</td>
<td>6(1.6%)</td>
</tr>
<tr>
<td>Grade 1-5</td>
<td>5(5.5%)</td>
<td>0(0%)</td>
</tr>
<tr>
<td>Grade 6-9</td>
<td>17(18.7%)</td>
<td>28(7.4%)</td>
</tr>
<tr>
<td>Up to G.C.E. O/L</td>
<td>33(36.3%)</td>
<td>182(48.3%)</td>
</tr>
<tr>
<td>Up to G.C.E A/L</td>
<td>19(20.9%)</td>
<td>112(29.7%)</td>
</tr>
<tr>
<td>Technical Education</td>
<td>1(1.1%)</td>
<td>28(7.4%)</td>
</tr>
<tr>
<td>Up to university education or beyond</td>
<td>10(11.0%)</td>
<td>21(5.6%)</td>
</tr>
<tr>
<td><strong>Employment status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>34(37.4%)</td>
<td>269(71.4%)</td>
</tr>
<tr>
<td>Ever employed</td>
<td>27(29.7%)</td>
<td>17(4.5%)</td>
</tr>
<tr>
<td>Currently employed</td>
<td>30(33.0%)</td>
<td>91(24.1%)</td>
</tr>
<tr>
<td><strong>Social class</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I -Leading professions</td>
<td>3(3.3%)</td>
<td>33(8.8%)</td>
</tr>
<tr>
<td>II- Lesser professions</td>
<td>15(16.5%)</td>
<td>57(15.1%)</td>
</tr>
<tr>
<td>III- Skilled workers and non-manual workers</td>
<td>65(71.4%)</td>
<td>256(67.9%)</td>
</tr>
<tr>
<td>IV-Partly skilled workers</td>
<td>2(2.2%)</td>
<td>18(4.8%)</td>
</tr>
<tr>
<td>V-Unskilled workers</td>
<td>6(6.6%)</td>
<td>13(3.4%)</td>
</tr>
</tbody>
</table>
The commonest histopathological entity was serous papillary cyst adenocarcinoma; accounting for 81.3% of all EOC, belonging to FIGO stage II (37.4%) at the time of surgery (table number 2). The odds ratios for the risk factors associated with EOC are summarized in table 3. The risk of having EOC was 2.6 times higher among women aged 50 years or older compared to those aged below 50 years (AOR= 2.6, 95% C.I: 1.2-5.3). Women who had been employed any time during life were at higher risk of developing EOC compared to women who had never been employed (AOR=2.3, 95% C.I:1.1-4.8). Those who were educated beyond GEC O/L were at higher risk of developing EOC compared to their counterparts (AOR=4.2, 95% C.I: 2.0-9.0). The risk of having EOC was 60% less among women with a lengthy menstrual cycle >35 days (AOR=0.4, 95% C.I: 0.2-0.9). The women who had continued breastfeeding beyond 24 months were protected against EOC compared to women who had never breastfed and women who had not continued breastfeeding up to 24 weeks (AOR=0.1, 95% C.I:0.06-0.4). The risk of getting EOC was reduced by 90% among the women who had taken OCP for more than two years, compared to women who had taken OCP for less than 2 years and who had never taken OCP (AOR=0.1, 95% C.I: 0.03-0.3). Menopaused women were found to be having a risk five times greater for developing EOC (AOR=5.1, 95% C.I:2.4-10.8). The risk of having EOC was 10 times high among women who gave a history of breast, ovarian or colonic cancer among their first-degree relatives, compared to the women who did not have such positive family history (AOR=10.2, 95% C.I: 3.7-28.6). Those who had ever been exposed to abdominal X-ray were 3 times more likely to develop EOC (AOR=3.4, 95% C.I:1.2-9.8).

Table 2: Distribution of the cases by histology and staging

<table>
<thead>
<tr>
<th>Disease characteristic</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Histopathological diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Serous papillary cyst adenocarcinoma</td>
<td>74(81.3%)</td>
</tr>
<tr>
<td>Endometrioid adenocarcinoma</td>
<td>09(9.9%)</td>
</tr>
<tr>
<td>Mucinous cystadenocarcinoma</td>
<td>05(5.5%)</td>
</tr>
<tr>
<td>Clear cell adenocarcinoma</td>
<td>03(3.3%)</td>
</tr>
<tr>
<td><strong>Staging (FIGO)</strong></td>
<td></td>
</tr>
<tr>
<td>Stage I</td>
<td>12(13.2%)</td>
</tr>
<tr>
<td>Stage II</td>
<td>34(37.4%)</td>
</tr>
<tr>
<td>Stage III</td>
<td>29(31.9%)</td>
</tr>
<tr>
<td>Stage IV</td>
<td>15(16.5%)</td>
</tr>
</tbody>
</table>

Table 3: Risk factors associated with epithelial ovarian cancer

<table>
<thead>
<tr>
<th>Predictor variable</th>
<th>Cases (%)</th>
<th>Controls (%)</th>
<th>Unadjusted OR (95% C.I)</th>
<th>Adjusted OR (95% C.I)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at recruitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age ≥50 years</td>
<td>68(74.7%)</td>
<td>210(55.7)</td>
<td>2.4(1.4-3.9)</td>
<td>2.6(1.2-5.3)</td>
</tr>
<tr>
<td>Category</td>
<td>*Age &lt; 50 years</td>
<td>10 Years</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------</td>
<td>----------</td>
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<td>------</td>
</tr>
<tr>
<td>Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ever employed</td>
<td>57(62.6%)</td>
<td>108(28.6%)</td>
<td>4.2(2.6-6.7%)</td>
<td>2.3(1.1-4.8%)</td>
</tr>
<tr>
<td>*Never employed</td>
<td>34(37.4%)</td>
<td>269(71.4%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Rs. 30,000</td>
<td>14(15.4%)</td>
<td>34(9.0%)</td>
<td>1.8(0.9-3.6)</td>
<td>1.4(0.5-4.0)</td>
</tr>
<tr>
<td>*≥ Rs. 30,000</td>
<td>77(84.6%)</td>
<td>343(91.0%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ (GCE) Ordinary Level</td>
<td>61(67.0%)</td>
<td>216(57.3%)</td>
<td>1.5(0.9-2.5)</td>
<td>4.2(2.0-9.0)</td>
</tr>
<tr>
<td>*&gt; (GCE) Ordinary Level</td>
<td>30(33.0%)</td>
<td>161(42.7%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Age at menarche</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menarche &lt; 11 years</td>
<td>21(23.1%)</td>
<td>39(10.3%)</td>
<td>2.6(1.4-4.7)</td>
<td>2.4(0.9-6.3)</td>
</tr>
<tr>
<td>*Menarche ≥ 11 years</td>
<td>70(76.9%)</td>
<td>338(89.7%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Menstrual regularity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irregular periods &gt;36 days</td>
<td>17(18.7%)</td>
<td>117(31.0%)</td>
<td>0.5(0.3-0.9)</td>
<td>0.4(0.2-0.9)</td>
</tr>
<tr>
<td>*Regular periods ≤ 35 days</td>
<td>74(81.3%)</td>
<td>260(69.0%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Parity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>32(35.2%)</td>
<td>47(12.5%)</td>
<td>3.8(2.2-6.4)</td>
<td>1.4(0.4-4.7)</td>
</tr>
<tr>
<td>*Parous</td>
<td>59(64.8%)</td>
<td>330(87.5%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Duration of breastfeeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥24 months</td>
<td>47(51.6%)</td>
<td>297(78.8%)</td>
<td>0.3(0.2-0.5)</td>
<td>0.1(0.06-0.4)</td>
</tr>
<tr>
<td>*&lt;24 months¹</td>
<td>06(6.6%)</td>
<td>27(7.1%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>No breastfeeding¹</td>
<td>38(41.8%)</td>
<td>53(14.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of OCP use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCP used ≥ 2 years</td>
<td>09(9.9%)</td>
<td>144(38.2%)</td>
<td>0.1(0.04-0.2)</td>
<td>0.1(0.03-0.3)</td>
</tr>
<tr>
<td>*OCP used &gt; 2 years²</td>
<td>14(15.4%)</td>
<td>45(11.9%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Never used²</td>
<td>72(79.1%)</td>
<td>188(49.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menopausal status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postmenopausal</td>
<td>62(68.1%)</td>
<td>153(40.6%)</td>
<td>3.1(1.9-5.9)</td>
<td>5.1(2.4-10.8)</td>
</tr>
<tr>
<td>*Premenopausal</td>
<td>29(31.9%)</td>
<td>224(59.4%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Age at menopause</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at menopause ≥ 55 years</td>
<td>10(16.13%)</td>
<td>14(9.15)</td>
<td>1.9(0.8-4.6)</td>
<td>1.1(0.3-3.9)</td>
</tr>
<tr>
<td>*Age at menopause &lt; 55 years</td>
<td>52(83.87%)</td>
<td>139(90.85%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>Family History of Breast/Ovary/Colon among first-degree relatives</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23(25.3%)</td>
<td>25(6.6%)</td>
<td>4.8(2.6-8.9)</td>
<td>10.2(3.7-28.6)</td>
</tr>
<tr>
<td>*No</td>
<td>68(74.7%)</td>
<td>352(93.4%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
</tbody>
</table>
### V. DISCUSSION

In the present study women, who were aged 50 years or more, who had been educated beyond GCE (O/L), who had been employed any time during life, who had already attained menopause, who had a positive family history of carcinoma of the breast/ovary/colon in a first-degree relative, and who had been exposed to abdominal X rays were at risk of developing EOC. Women who were found to be having irregular menstrual cycles lasting > 35 days, who had continued breastfeeding > 24 months, and who had used OCP for more than 2 years were protected against EOC.

We adhered to the following measures in the methodology to minimize the bias introduced in a case control study. For the present study, cases were recruited from all the tertiary care hospitals in the Colombo district, Sri Lanka, and controls were selected from the community in the Colombo district, where the cases also were residents. This ensured the greatest level of comparability since they represented the same source population from where the cases originated. We used incident cases, since in case-control studies they are better preferred compared to the prevalent cases, as the individuals may modify their exposure to the elements of concern once cancer/disease is diagnosed, or due to complications caused by the disease. In our study, due to the limited number of cases identified during the limited period, we recruited four controls per case, thereby improving the statistical power of the study. In order to mitigate recall, bias a life event calendar was given to both cases and controls with enough time to complete before answering, so as to facilitate

---

**Exposure to passive smoking**

<table>
<thead>
<tr>
<th>Yes</th>
<th>15(16.5%)</th>
<th>26(6.9%)</th>
<th>2.7(1.3-5.3)</th>
<th>3.2(1.0-10.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>76(83.5%)</td>
<td>351(93.1%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
</tbody>
</table>

**Exposure to abdominal X-ray**

<table>
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<tr>
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<th>14(15.4%)</th>
<th>30(8.0%)</th>
<th>2.1(1.1-4.2)</th>
<th>3.4(1.2-9.8)</th>
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</thead>
<tbody>
<tr>
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<td>77(84.6%)</td>
<td>347(92.0%)</td>
<td>Ref</td>
<td>Ref</td>
</tr>
</tbody>
</table>

**Waist-to-hip ratio**

| Waist/Hip ratio ≥ 0.86 | 53(58.2%) | 179(47.5%) | 1.7(1.1-2.8) | 0.8(0.4-1.6) |
| < 0.86 | 38(41.8%) | 198(52.5%) | Ref | Ref |

**Occupational activities**

| Low | 32(35.2%) | 108(28.6%) | 1.4(0.8-2.2) | 1.5(0.7-3.4) |
| Moderate | 40(44.0%) | 195(51.7%) | Ref | Ref |
| High | 19(20.8%) | 74(19.7%) | | |

**Household activities**

| Low | 53(58.2%) | 218(57.8%) | 1.0(0.6-1.6) | 1.3(0.6-2.8) |
| Moderate | 19(20.9%) | 106(28.1%) | Ref | Ref |
| High | 19(20.9%) | 53(14.1%) | | |

*Reference

1. Duration of breastfeeding <24 months and subjects with no history of breastfeeding were taken as reference
2. Duration of OCP use <2 years and subjects with no history of OCP use were taken as reference
3. Moderate and high levels of occupational activities were taken as the reference value
4. Moderate and high levels of household activities were taken as the reference value
reflecting and recalling through a sequence of events in their lives. Verification of exposure details was done by referring to medical records, thereby minimizing recall bias. The study population consisted of subjects from diverse educational backgrounds, hence their literacy rates understandably were different. Therefore, the administration of interviewer-administered questionnaires reduced the missing data, at the same time minimizing information bias.

The present study revealed that women of age >50 years have a higher risk of getting EOC and according to previous studies, median age at diagnosis is 50–79 years\(^{(32, 33)}\). In the present study, education beyond GCE (O/L) was found to be a statistically significant risk factor. This could be explained by the fact that those who aspire for higher education voluntarily delay starting a family which could have negative implications on their risk of ovarian cancer. Similarly, a study conducted on 1,031 cases of invasive EOC and 2,411 controls from 1992-1999 in Italy reported a higher risk of developing cancer among the women who had achieved the highest level of education\(^{(34)}\). A study conducted in the Shanghai area had shown a statistically significant increase in the incidence of EOC among professionals, technical workers, and scientists\(^{(15)}\). In the present study, it was the women who were ever involved in a job who were found to be having a higher risk of EOC. However, subgroups of the occupations could not be analyzed in relation to EOC in the present study, since the sample size in each occupational category was small.

Having lengthy menstrual cycles as a result of fewer ovulations has been shown to be a protective factor against EOC in the present study. Some other studies have also reported an inverse association between irregular lengthy cycles and EOC\(^{(14, 36)}\), while one study had found no association\(^{(37)}\).

In the present study, the risk of developing EOC was reduced by 90% in women who continued breastfeeding for a period of exceeding 24 months. Similar inferences were made in two meta-analyses and one population-based study; Here it was shown that breastfeeding for a period over 12 months conferred a significant protective effect\(^{(22)}\), a reduction of the risk by 8% for each additional 5 months to the duration of breastfeeding\(^{(38)}\), and breast feeding for beyond 18 months\(^{(39)}\). On the contrary, another study revealed no statistically significant association\(^{(40)}\). During pregnancy and lactation, ovulation is suppressed, and the gonadotrophin levels are also reduced. The subsequent reduction in oestradiol levels could be the plausible physiological mechanism behind this protective effect\(^{(41, 42)}\).

In our study, OCP use for\(\geq 2\) years was found to have a protective effect against EOC. Similar findings were reported by the Collaborative Group on Epidemiological Studies of Ovarian Cancer\(^{(43)}\), and also by a population-based, case-control study\(^{(27)}\) where they had concluded that longer the duration of OCP use, the better the protective effect was.

In the present study, the risk associated with menopause for the development of EOC was 5.1 times higher compared to that for those women who were yet to reach menopause. In the published studies, direct information on the risk conferred by the menopausal status on EOC is scarce. One such study revealed that the ovarian cancer risk dramatically increases around the peri-menopausal age and in the immediate post-menopausal period, and thereafter continues to pose a significant risk as the ovary ages\(^{(44)}\).

In our study, a positive family history of carcinoma of the breast, ovary or colon in a first-degree relative was a statistically significant risk factor for the development of EOC in the index subject. The findings of our study were also consistent with the findings of the other studies published in the literature\(^{(13, 18, 45)}\). In our study, due to the limited sample size, women with a first-degree relative with cancers that were known to have a genetic link were grouped together. Hence, the familial risks conferred by individual cancers could not be elicited.

In the present study, ever exposure to abdominal X-rays during a lifetime was found to be a statistically significant risk factor. The evidence on the effect of abdominal X-rays on ovarian cancer is sparse in the literature. A univariate analysis performed in a case-control study conducted to explore the effect of diagnostic X-rays and the risk of EOC among Jewish women showed no association between exposure to abdominal or pelvic X-rays within 10 years or more\(^{(46)}\).
The limitations of our study were as follows: Even though we used life event calendars, the effect of recall bias on the information on lifetime physical activity levels could not be completely corrected. Our study was a retrospective case-control study, and therefore causal relationships could not be elicited. It was not possible to carry out subgroup analysis as the number included in each category of histopathological subtypes of EOC was small.

In conclusion, having irregular menstrual cycles lasting more than 35 days, breastfeeding for an average of 24 months or longer, and use of OCP for 2 years or more were found to be protective factors against EOC after adjusting for possible confounding factors. Being a woman aged 50 years or older, having been educated beyond G.C.E (O/L), being employed at some point in life, being menopausal, having a positive family history for carcinoma of the breast/ovary/colon in a first-degree relative, and having been exposed to abdominal X-rays were found to be risk factors after adjusting for possible confounding factors.

The association between reproductive, genetic, and lifestyle risk factors and epithelial ovarian cancer, needs to be further studied using prospective research methodologies followed by Mendelian Randomization studies to triangulate causal relationships and to eliminate confounding bias.

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Conflict of interest not declared.

AUTHORS

First Author – Dr Gunathilake K.A.M.P, qualifications- MB BS, MSc in Community Medicine, MD in Community Medicine, associated institute- Regional Director’s of Health Services office, Kandy, Sri Lanka, email; madhigee@gmail.com

Second Author Dr Kumarapeli V., qualifications- MB BS, MSc in Community Medicine, MD in Community Medicine, associated institute- Non-Communicable Disease Unit, Ministry of Health, Sri Lanka, email; vindyalk@yahoo.com

Third Author – Professor Kaluarachchi A., qualifications- MBBS, MS, MRCOG, MRCPI, FRCOG, FSLCOG, associated institute; Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Colombo, Sri Lanka, email; athula_kal@yahoo.com, akaluarachchi@obg.cmb.ac.lk

Fourth Author Dr Hunukumbure R.M.C.B., qualifications- MBBS, MD, MRCOG, associated institute; Subfertility Unit, Colombo North Teaching Hospital, Ragama, Sri Lanka, email; rmbbhunu@yahoo.com

Correspondence Author – Dr Gunathilake K.A.M.P., email address; madhigee@gmail.com, contact number+94715355563, +447563308834

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Hydrochemical Properties And Groundwater Quality Assessment In Kurudu Area, Abuja, North Central Nigeria

*Oghenero G. Siloko¹, Mohammed A. Mojeed² and Ridwan O. Alabi³

¹,²Department of Geology and Mineral Sciences, University of Ilorin, P. M. B. 1515, Ilorin, Nigeria.
³Institute of Applied Geosciences, Technical University of Darmstadt, 64287 Darmstadt, Germany.

*For Correspondence: Oghenerosiloko@gmail.com

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Abstract: The hydrochemical properties and groundwater quality assessment of groundwater samples from Kurudu area of Abuja, north central Nigeria, was investigated with the aim to evaluating their suitability for drinking and irrigation purposes. Physicochemical parameters such as temperature, pH, total dissolved solids, total hardness, and electrical conductivity were analysed. The major cations and anions were also analysed. Hydrochemical facies of the water samples were analysed employing Piper diagram and Gibbs diagram while the suitability of the water for irrigation purposes was assessed using indices such as Kelly’s ratio, Sodium percentage ratio, Magnesium hazard, Permeability Index and Sodium Absorption Ratio (SAR). The physicochemical parameters of the water samples are within the acceptable limit recommended by WHO (2011). Physiochemical results showed that the dominant cation occur in the order of Ca²⁺ > Na⁺ > K⁺ > Mg²⁺ with average values of 19.9mg/l, 16.15mg/l, 7.01mg/l and 4.38mg/l respectively, while the dominant anion ranged in the order of HCO₃⁻ > Cl⁻ > SO₄²⁻ > NO₃⁻ with average values of 56.93mg/l, 35.5 mg/l, 8.38mg/l and 3.85mg/l respectively. The dominant hydrochemical facies identified in the samples is the mixed Ca-Mg-Cl which is a result of linear mixing processes of water in the study area. Gibbs plot indicated that ions concentration in the water is primarily contributed by chemical weathering of the rock-forming minerals. Irrigation indices all suggested that the water samples are good for irrigation purposes. Results from the study indicate that, with a few exceptions, water in the study area is suitable for human consumption and irrigation purposes.

Keywords: Groundwater quality, hydrochemical facies, irrigation, Kurudu, physiochemical.

I. INTRODUCTION

Groundwater is a vital and essential water source for domestic, agricultural, and industrial use. It is most reliable water source for human consumption. However, this water resource faces many challenges including contamination, pollution, degradation and over abstraction. Groundwater resource is largely affected by industrial development, urbanization, agricultural and mining activities. The quality of groundwater is an important factor to determine its suitability for domestic and agricultural purposes. The usefulness of water also depends on its physical and chemical properties. Recently, a study conducted by the World Health Organization revealed that the contamination of ground water is responsible for the mortality of about 1.5 million kids annually (WHO 2017;WHO & UNICEF 2014). The reality of WHO statistics gives an insight into the health and the socio-economic status of affected countries linking the possible solutions to the high death rate to the ability to provide drinkable water (Chandrasekar et al., 2014; Chuah et al., 2016; Das & Nag 2017; Edjah et al., 2017).

The hydrochemical studies of some subsurface water extensively depend on the rate of precipitation of minerals present in the host rock, the interaction between underground aquifers and the soil, rate of water recharge and other anthropogenic sources (Alfy et al.,
2018; Emenike et al., 2016; Emenike et al., 2017). The statistical analysis of the total dissolved solids (TDS), hydrogen ion concentration (pH), electrical conductivity (EC) amongst others have proved useful in clarifying the evaluation of groundwater contamination (Alfy et al., 2018; Gbadebo 2012, Giridharan et al., 2008; Giridharan et al., 2009; Golchin & Moghaddam 2016). In Kurudu, Abuja, groundwater is useful for daily domestic, agricultural and industrial activities (Barzegar et al., 2017; Igibah & Tanko 2019). The usage of groundwater in Kurudu, the study area, is grossly affected by contamination caused by anthropogenic activities. Generally, most groundwater contamination in Abuja is mostly from abattoirs, wood processing mills, and mechanical workplaces, mainly through improper waste disposal. The well-being of residents in this area has been compromised. Thus, there is a need to investigate the level of groundwater contamination in the study area in order to ascertain the suitability of the water for human consumption. The recent study aims to assess the groundwater quality in Kurudu Area, Abuja, by evaluating the physicochemical parameters and irrigation indices of the water samples to determine their suitability for domestic and agricultural purposes.

II. DESCRIPTION OF THE STUDY AREA

The area studied is Kurudu, a peri-urban fragment of the Abuja Municipal Area Council (AMAC). Abuja is an area of geological interest evident in the presence of the Aso rock, which has about 400 meter megalith and the Zuma rock which has about 800-meter megalith. Kurudu is located within latitude $8^\circ 0^1 55^\prime 53^\prime\prime$ N as well as Longitude $7^\circ 3^1 33^\prime 00^\prime\prime$ E. Kurudu is a relatively major town that falls under Asokoro, bounded by communities such as Guzape, Aya, Nyanyu, and the new Karu. The area is a good fit for this research work because the expansion and growth of Abuja have directed people to such areas. Figure 1 shows the location map of the study area.

Figure 1: Location map of the study area showing the water samples.
III. METHODOLOGY

Sixteen (16) water samples were collected from the boreholes within the study area. Before the samples used in this study were collected, polyethylene (plastic) bottles with lids were washed properly with sanitized H₂O adding a little tri-oxo nitrate V acid after which the bottles were air dried. The bottles were washed thrice with the identified water sample at the sample site before filling and labelling. The well-labeled water samples were then taken to the laboratory and kept under a temperature of 4°C, the standard method of preservation was followed (APHA 2005). The taps of the identified boreholes were left to run for an average of 5-15 minutes before five samples were randomly selected to calculate the average physico-chemical parameters. Measurement of pH (H⁺ concentration), electrical conductivity (EC), total dissolved solids (TDS), and the measure of alkalinity were conducted on the site through the use of Hanna 198194 pH, EC, and TDS meter. Other water properties such as the cation, silica (SiO₂), sodium (Na⁺), Magnesium Mg⁺, Potassium K⁺ and Calcium Ca²⁺ and major anions such as chloride Cl⁻, carbonate CO₃²⁻, Sulphate SO₄²⁻, Nitrates NO₃⁻ were identified using the APHA standard (APHA, 2005). The water samples were analysed using software and the statistical test was carried using SPSS software.

IV. RESULTS AND DISCUSSION

A. Physicochemical Characteristics

Physicochemical parameters such as temperature, pH, total hardness (TH), electrical conductivity (EC), total dissolved solids (TDS) along with dominant anions and cations were analyzed for all water samples and their results are presented in Table 1. The temperature of the water samples ranged from 22.2°C to 27.9°C with average of 25.76°C. The temperature values are within the WHO (2011) permissible limit of 30°C.

The pH of the samples ranged from 2.51 to 7.25 with an average of 6.14 which indicates that the water samples are dominantly acidic to slightly alkaline. The relatively acidic values of the water could be attributed to dissolve CO₂ in the water. Only six (6) of the water samples fall within the WHO permissible limit of 6.5 - 9.2 pH values for drinkable water.

The Electrical conductivity (EC) of water generally depends on mobility and concentration of ions in the water. The EC of the water samples ranged from 30 - 650 with an average of 316. All water samples fall within the WHO (2011) limit of 1500 (Table 2). According to Sarath Prasanth et al., (2012), the electrical conductivity can be divided into three types depending on the salt enrichment levels: type I if the salt enrichments are modest (EC: 1500 µs/cm), type II between 1500 and 3000 µs/cm, and type III over 3000 µs/cm. Hence, the water samples falls within type I accordingly to their salt enrichment.

Total dissolved solid (TDS) is a measure of how many different kinds of dissolved minerals are in a given volume of water. Minerals such as bicarbonates, phosphates, potassium, calcium, carbonates, chlorides, sulfates, magnesium, sodium, and potassium make up the bulk of the dissolved solids found in natural waters. The TDS values for the samples ranged from 20mg/l to 360mg/l with average of 173mg/l. The WHO (2011) permissible limits for TDS is 500mg/l indicating all samples falls within the permissible limit of drinking water specified by WHO. According to Todd (1980), water can be classed fresh if the TDS is less than 1000 mg/l; brackish if the TDS is between 1000 and 10,000 mg/l; salty if the TDS is between 10,000 and 1,000,000 mg/l; and brine if the TDS is greater than 1,000,000 mg/l; indicating all samples from the study area are fresh having TDS values less than 1000mg/l.

The total hardness of the water samples ranged from 13mg/l to 165mg/l with average of 71mg/l. All water samples falls within the WHO (2011) acceptable limits of 150mg/l except samples SI5 and SI15 with total hardness values of 165mg/l and 160mg/l respectively. According to Sawyer and McCarty (1967), soft water has calcium carbonate less than 75mg/l, moderate hard (75mg/l - 150mg/l), hard water sample (150mg/l to 300mg/l) while very hard water contains calcium carbonate greater than 300mg/l. Hence, the water samples can be classified as soft to moderate hardness except sample SI5 and SI15 which fall under hard.

The major anions and cations concentration of water samples were analysed to evaluate the dominant anions and cations. Results showed the dominant cation ranged in the order of Ca²⁺ > Na⁺ > K⁺ > Mg²⁺ with average values of 19.9mg/l, 16.15mg/l, 7.01mg/l and 4.38mg/l respectively while the dominant anion ranged in the order of HCO₃⁻ > Cl⁻ > SO₄²⁻ > NO₃⁻ with average values of 56.93mg/l, 35.5 mg/l, 8.38mg/l and 3.85mg/l respectively.

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Table 1: Physiochemical parameters of water samples in the study area.

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Temp °C</th>
<th>pH</th>
<th>EC</th>
<th>TDS</th>
<th>TH</th>
<th>Na⁺</th>
<th>K⁺</th>
<th>Ca²⁺</th>
<th>Mg²⁺</th>
<th>Cl⁻</th>
<th>HCO₃⁻</th>
<th>SO₄²⁻</th>
<th>NO₃⁻</th>
<th>F⁻</th>
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<td>22.3</td>
<td>6.47</td>
<td>120</td>
<td>70</td>
<td>54</td>
<td>2.34</td>
<td>0.82</td>
<td>17.02</td>
<td>2.27</td>
<td>24</td>
<td>36</td>
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<td>0.7</td>
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<td>41</td>
<td>17.94</td>
<td>4.11</td>
<td>12.81</td>
<td>3.11</td>
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<td>26</td>
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<td>0.001</td>
<td>0.01</td>
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<tr>
<td>SI16</td>
<td>27.9</td>
<td>2.51</td>
<td>650</td>
<td>360</td>
<td>41</td>
<td>18.72</td>
<td>3.69</td>
<td>12.56</td>
<td>4.01</td>
<td>88.67</td>
<td>67</td>
<td>0.9</td>
<td>6</td>
<td>0.09</td>
<td>0.41</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>25.8</td>
<td>6.14</td>
<td>316</td>
<td>173</td>
<td>71</td>
<td>16.15</td>
<td>7.01</td>
<td>19.92</td>
<td>4.38</td>
<td>35.51</td>
<td>56.94</td>
<td>8.38</td>
<td>3.85</td>
<td>0.16</td>
<td>1.86</td>
</tr>
<tr>
<td><strong>Min</strong></td>
<td>22.2</td>
<td>2.51</td>
<td>30</td>
<td>20</td>
<td>13</td>
<td>0.78</td>
<td>0.41</td>
<td>2.18</td>
<td>1.05</td>
<td>12.1</td>
<td>18</td>
<td>1.7</td>
<td>0.001</td>
<td>0.01</td>
<td>0.14</td>
</tr>
<tr>
<td><strong>Max</strong></td>
<td>27.9</td>
<td>7.25</td>
<td>650</td>
<td>360</td>
<td>165</td>
<td>24.94</td>
<td>16.81</td>
<td>39.24</td>
<td>10.81</td>
<td>88.67</td>
<td>180</td>
<td>17.85</td>
<td>21</td>
<td>0.43</td>
<td>11.27</td>
</tr>
</tbody>
</table>

Table 2: Summary of the physiochemical parameters of the study area compared with WHO (2011).

<table>
<thead>
<tr>
<th>Physiochemical Parameters</th>
<th>Average</th>
<th>Min</th>
<th>Max</th>
<th>WHO standard (2011)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp °C</td>
<td>25.76</td>
<td>22.2</td>
<td>27.9</td>
<td>30</td>
</tr>
<tr>
<td>pH</td>
<td>6.14</td>
<td>2.51</td>
<td>7.25</td>
<td>6.5-9.2</td>
</tr>
<tr>
<td>EC</td>
<td>316</td>
<td>30</td>
<td>650</td>
<td>1500</td>
</tr>
<tr>
<td>TDS</td>
<td>173</td>
<td>20</td>
<td>360</td>
<td>100</td>
</tr>
<tr>
<td>TH</td>
<td>71</td>
<td>13</td>
<td>165</td>
<td>150</td>
</tr>
<tr>
<td>Na⁺</td>
<td>16.15</td>
<td>0.78</td>
<td>24.94</td>
<td>200</td>
</tr>
<tr>
<td>K⁺</td>
<td>7.01</td>
<td>0.41</td>
<td>16.81</td>
<td>12</td>
</tr>
<tr>
<td>Ca²⁺</td>
<td>19.92</td>
<td>2.18</td>
<td>39.24</td>
<td>75</td>
</tr>
<tr>
<td>Mg²⁺</td>
<td>4.38</td>
<td>1.05</td>
<td>10.81</td>
<td>50</td>
</tr>
<tr>
<td>Cl⁻</td>
<td>35.51</td>
<td>12.1</td>
<td>88.67</td>
<td>250</td>
</tr>
<tr>
<td>HCO₃⁻</td>
<td>56.94</td>
<td>14</td>
<td>180</td>
<td>500</td>
</tr>
<tr>
<td>SO₄²⁻</td>
<td>8.38</td>
<td>0.85</td>
<td>17.85</td>
<td>250</td>
</tr>
<tr>
<td>NO₃⁻</td>
<td>3.85</td>
<td>0.001</td>
<td>21</td>
<td>45</td>
</tr>
</tbody>
</table>

B. Statistical Analysis

Statistical analysis was carried out using Pearson correlation matrix, the degree of linear association between two numerical variables is quantified using Pearson's correlation analysis. It gives shorthand for the relative size of linearly related sets of data. There is a range of possible values for relationship, from minus one to plus one, with plus one indicating a perfectly positive linear relationship, zero indicating no linear relationship, and negative one indicating a perfectly inverse linear relationship (Singh and Chandra, 2015). Table 3 shows the Pearson correlation matrix between physiochemical parameters of the water samples collected from the study area. The bold values show areas of positive correlations between parameters. Total hardness (TH) correlates positively with cations and increases with increasing cation concentration with Ca²⁺, exhibiting the highest correlation value of 0.97. While concentrations of anions such as HCO₃⁻ and SO₄²⁻ shows positive correlation with dominant cation of Na⁺, Mg²⁺, K⁺ and Ca²⁺. Except for a small number of outliers, the concentrations of the key ions tested tend to rise as TDS increases, showing positive correlation.
Table 3: Pearson correlation matrix between physiochemical parameters of the samples.

<table>
<thead>
<tr>
<th>Variables</th>
<th>pH</th>
<th>EC</th>
<th>TDS</th>
<th>TH</th>
<th>Na</th>
<th>K</th>
<th>Ca</th>
<th>Mg</th>
<th>Cl</th>
<th>HCO3</th>
<th>SO4</th>
<th>NO3</th>
<th>F</th>
<th>PO4</th>
</tr>
</thead>
<tbody>
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<td>pH</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC</td>
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<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TDS</td>
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<td>0.9973</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>TH</td>
<td>0.4212</td>
<td>0.5761</td>
<td>0.5987</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Na</td>
<td>0.1177</td>
<td>0.7702</td>
<td>0.7539</td>
<td>0.5617</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>0.2915</td>
<td>0.4860</td>
<td>0.4928</td>
<td>0.6313</td>
<td>0.7941</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Ca</td>
<td>0.4262</td>
<td>0.5858</td>
<td>0.6018</td>
<td>0.9733</td>
<td>0.5370</td>
<td>0.5215</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mg</td>
<td>0.3134</td>
<td>0.6265</td>
<td>0.6476</td>
<td>0.9173</td>
<td>0.6590</td>
<td>0.7135</td>
<td>0.8350</td>
<td>1</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Cl</td>
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<td>0.8106</td>
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<td>-0.0258</td>
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<td>0.3037</td>
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<td>HCO3</td>
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<td>0.5924</td>
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<td>0.8944</td>
<td>0.5244</td>
<td>0.6884</td>
<td>0.8049</td>
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<tr>
<td>SO4</td>
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<td>0.7483</td>
<td>0.8031</td>
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<td>-0.0402</td>
<td>0.7338</td>
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<tr>
<td>NO3</td>
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<td>0.4548</td>
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<td>0.1267</td>
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<td>0.1967</td>
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<tr>
<td>F</td>
<td>0.3981</td>
<td>0.5647</td>
<td>0.5876</td>
<td>0.8402</td>
<td>0.6693</td>
<td>0.6819</td>
<td>0.8129</td>
<td>0.7631</td>
<td>0.3435</td>
<td>0.8371</td>
<td>0.7900</td>
<td>-0.0904</td>
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<tr>
<td>PO4</td>
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<td>0.4989</td>
<td>0.8509</td>
<td>0.4818</td>
<td>0.6950</td>
<td>0.7511</td>
<td>0.8390</td>
<td>0.2274</td>
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<td>0.7413</td>
<td>-0.1078</td>
<td>0.8443</td>
<td>1</td>
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</tbody>
</table>

Values in bold are different from 0 with a significance level alpha=0.05

C. Hydrochemical Facies

It is possible to gain an understanding of the geochemical development of groundwater by plotting the concentrations of main cations and anions in the Piper trilinear diagram. It is a mixture of the anion triangle and the cation triangle, and it rests on the same base line (Singh and Kumar, 2015). Hydrochemical facies can be predicted with the help of the Piper Trilinear Diagram (1944).

Piper diagram was plotted showing the hydrochemical facies of the water samples in the study area. Four hydrochemical facies have been identified, they include Na-Cl type, Ca-HCO3 type, Na-Ca-HCO3 type and mixed CaMgCl water type which corresponds to type 1, 2, 3 and 4 respectively. The dominant water type is the mixed CaMgCl which is a result of linear mixing processes of water, while water facies type 1 and 2 results from ion exchange activities between Calcium and Sodium (Figure 2).

The majority of the samples plot along the simple dissolution or mixing line in the Durov diagram (Figure 3), further supporting the idea that mixed water type predominates in the study area. Using the categorization developed by Lloyd and Heathcoat (1985), we can explain this pattern as the result of simple dissolution or mixing in recharged fresh water, with neither an anion nor cation dominating the system. Dolomite association is indicated by the presence of Ca$^{2+}$ and HCO$_3^-$ as the dominant anion and cation in a small number of samples.

The chemical composition of the water samples can be shown and compared with greater precision using a Stiff diagram (Stiff, 1957), which displays the absolute value of major ions. Total ionic content can be roughly estimated from the pattern's width. Almost all samples share the same dominant cation (Ca$^{2+}$) and anion (HCO$_3^-$), as shown by the consistent pattern (Figure 4). In order to comprehend where the dissolved ions in groundwater come from, it is helpful to look at Gibb's diagram (Figure 5). The majority of water samples lie inside the zone where rock weathering is predominate. Except for samples SI1 and SI15, which show precipitation dominance, Gibb's diagrams indicate that ions concentration in the water is primarily contributed by chemical weathering of the rock-forming minerals.
Figure 2: Piper Diagram showing hydrochemical facies of the water samples in the study area.

Figure 3: Durov diagram showing position of water samples in the study area.
D. Water Quality Assessment for Irrigation Purpose
The quality of water for various uses, including drinking by humans and animals, irrigation of crops, and other similar activities, will be determined by the concentration and composition of soluble salts in the water. When it is anticipated that salinity buildup will be an issue in an irrigated agricultural area, the quality of the water is an essential component that must be considered in order to ensure the sustainable use of water for agricultural irrigation (Zaman, 2018).

**Sodium Absorption Ratio (SAR):**

Because a high sodium concentration in irrigation water may increase soil hardness and diminish permeability, Sodium Absorption Ratio is significant in analysing the quality of groundwater for the purpose of irrigation. This is because this can inhibit the delivery of water that is necessary for the growth of crops. Mathematically, SAR can be expressed as

$$\text{SAR} = \frac{\text{Na}^+}{\sqrt{\frac{1}{2} (\text{Ca}^{2+} + \text{Mg}^{2+})}}$$

The groundwater samples in the study area have SAR values that ranged from 0.109 to 1.27 with mean value of 0.86. The SAR values show the water samples are suitable for irrigation purposes as classified by (Mandel and Shiftan, 1991) which classed SAR value greater than 10 as unsuitable for irrigation purposes. The salinity hazard of the samples were also evaluated using the US salinity laboratory (1954) shown in (Figure 6). The samples plotted dominantly on C2 and S1 which corresponds to medium salinity levels and low sodium hazard.

**Sodium Percentage (Na %):**

Since sodium reacts with soil to reduce its permeability, measuring the sodium level of groundwater is crucial for categorising irrigation water. When the sodium concentration in irrigation water is high, the clay particles absorb sodium ion, pushing out Ca\(^{2+}\) and Mg\(^{2+}\) ions. A decrease in permeability occurs when sodium in water is exchanged for Ca\(^{2+}\) and Mg\(^{2+}\) in soil (Ayuba et al., 2016). The Sodium Percentage could be expressed mathematically below as:

$$\text{Na}_% = \frac{\text{Na}^+ + \text{K}^+}{\text{Ca}^{2+} + \text{Mg}^{2+} + \text{Na}^+ + \text{K}^+} \times 100$$

The Na % of the water samples ranged from 10.59% to 58.71% with a mean value of 37.8%. According to (Ayuba et al., 2016), Na% < 20% is classed as excellent, 20 – 40% classed as good, 40-60% classed as permissible, 60-80% is doubtful while greater than 80% is classed as unsuitable. This classification indicates the water samples fall within excellent to permissible.

**Magnesium Hazard (MH)**

The presence of magnesium in soil and water would have a negative impact on the quality of those resources and make the soil unfit for cultivation for the purposes of calculating the magnesium hazard ratio. A magnesium concentration in a water sample that is greater than 50 percent will cause the water to be toxic to plants (Rajmohan and Elango, 2005), it can be mathematically expressed as:

$$\text{MH} = \frac{\text{Mg}^{2+}}{(\text{Ca}^{2+} + \text{Mg}^{2+})} \times 100$$

Table 4 shows that all water samples are suitable for irrigation purposes as Magnesium Hazard ratio percentage is greater than 50%.

**Kelly Ratio (KR)**

When deciding if groundwater is acceptable for irrigation, Kelly's ratio is can be employed. Kelly's ratio was first determined by comparing sodium to calcium and magnesium in 1951. Kelly's ratios greater than one (1) indicate that groundwater is unsuitable for use in irrigation systems. In the area under study, Kelly's ratios for water samples vary from 0.098 to 1.03, with a mean of 0.55. All the samples except SI2 passed Kelly's Ratio and may be used for irrigation.

**Permeability Index (PI):**
It is possible to gauge whether or not water is suitable for irrigation by measuring its permeability index (PI). Long-term exposure to irrigation water (especially water with a high salt concentration) can alter the soil's permeability since the Na\(^+\), Ca\(^{2+}\), Mg\(^{2+}\), and HCO\(_3\) ions all have a role in this characteristic (Rawat et al., 2018). It can be calculated mathematically by:

\[
PI = \frac{Na^+ + \sqrt{HCO_3^-}}{Ca^{2+} + Mg^{2+} + Na^+} \times 100
\]

Depending on the values of the PI, the irrigated water can be placed into one of three categories: Class I (more than 75%), Class II (25-75%), or Class III (less than 25%) (Marapatla and Reddy, 2018). The PI values of the water samples varied from 63.17% to 251.87% with a mean value of 89.77%, which can be categorized as class I and class II with over 90% falling under class I indicating that most of the samples are moderate to good in terms of suitability for irrigation purposes.

Table 4: The irrigation parameters of water samples of the study area.

<table>
<thead>
<tr>
<th>Sample ID</th>
<th>Na % ratio</th>
<th>Kellys Ratio</th>
<th>MHR (%)</th>
<th>PI</th>
<th>SAR</th>
</tr>
</thead>
<tbody>
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<td>SI1</td>
<td>10.594</td>
<td>0.098</td>
<td>18.029</td>
<td>76.451</td>
<td>0.141</td>
</tr>
<tr>
<td>SI2</td>
<td>58.714</td>
<td>1.033</td>
<td>15.363</td>
<td>93.328</td>
<td>1.270</td>
</tr>
<tr>
<td>SI3</td>
<td>42.954</td>
<td>0.672</td>
<td>28.166</td>
<td>84.784</td>
<td>0.906</td>
</tr>
<tr>
<td>SI4</td>
<td>49.638</td>
<td>0.869</td>
<td>15.469</td>
<td>75.003</td>
<td>1.165</td>
</tr>
<tr>
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<td>34.725</td>
<td>0.381</td>
<td>31.238</td>
<td>71.265</td>
<td>0.909</td>
</tr>
<tr>
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<td>40.031</td>
<td>0.566</td>
<td>32.005</td>
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<td>0.960</td>
</tr>
<tr>
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<td>63.177</td>
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</tr>
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<td>0.098</td>
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<tr>
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<td>0.381</td>
<td>31.238</td>
<td>71.265</td>
<td>0.909</td>
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<tr>
<td>SI12</td>
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<td>1.177</td>
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<td>0.558</td>
<td>26.414</td>
<td>89.777</td>
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<tr>
<td>Min</td>
<td>10.594</td>
<td>0.098</td>
<td>15.363</td>
<td>63.177</td>
<td>0.109</td>
</tr>
<tr>
<td>Max</td>
<td>58.714</td>
<td>1.033</td>
<td>44.268</td>
<td>251.875</td>
<td>1.270</td>
</tr>
</tbody>
</table>
Physicochemical and hydrochemical properties of groundwater samples from Kurudu area of Abuja, north central Nigeria, have been carried out. The physicochemical parameters of the water samples are within the acceptable limit recommended by WHO (2011). Water samples exhibit dominant cation ranged in the order of Ca\(^{2+}>\) Na\(^{+}>\) K\(^{+}>\) Mg\(^{2+}\) while the dominant anion varied in the order of HCO\(_3^{-}>\) Cl\(^{-}>\) SO\(_4^{2-}>\) NO\(_3^{-}\) respectively. The water in the study area is classified fresh according to total dissolved solid values. Results of hydrochemistry suggest that the samples consist of four hydrochemical facies of Na-Cl type, Ca-HCO\(_3\) type, Na-Ca-HCO\(_3\) type and mixed CaMgCl water type with dominantly mixed CaMgCl water type which is a result of linear mixing processes of water.

According to Gibb's diagram, chemical weathering of rock-forming minerals is principally responsible for the high concentration of ions seen in the water samples. All samples clustered heavily on C2 and S1 on the Wilcox diagram, indicating moderate salinity and a low sodium risk. With a few notable exceptions like pH, most parameters were found to be within safe drinking water levels when compared to WHO (2011) criteria. All of the groundwater samples appear to be fit for irrigation according to irrigation indicators including the Magnesium Hazard ratio, the Kelly ratio, the percentage of sodium, and the permeability index.

REFERENCES


AUTHORS

**First author** - Oghenero G. Siloko, Department of Geology and Mineral Sciences, University of Ilorin, P. M. B. 1515, Ilorin, Nigeria.

**Second author** - Mohammed A. Mojeed, Department of Geology and Mineral Sciences, University of Ilorin, P. M. B. 1515, Ilorin, Nigeria.

**Third author** - Ridwan O. Alabi, Institute of Applied Geosciences, Technical University of Darmstadt, 64287 Darmstadt, Germany.

**Corresponding author’s email**: Oghenerosiloko@gmail.com
Marketing Support Provided In The Incubation Centres And The Survival Of Small And Medium Enterprises (SMEs) In The Renewable Energy Sector In Kenya

Asenath Ndegwa
Postgraduate student, MBA in Entrepreneurship, Kenyatta University, Kenya

Dr. Jane Wanjira
Lecturer, Department of Business Administration, Kenyatta University –Kenya

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Abstract: Small businesses including those in the renewable energy sector face many challenges putting their survival at risk. In Kenya, 3 out of 5 SMEs close within the first two years after starting operations, and to enhance their survival many small businesses have turned to incubation. Thus, the purpose of the study was to establish the effect of marketing support from incubation centers on the survival of SMEs in the renewable sector in Kenya. The study is anchored on the market orientation theory and employed descriptive research design. The 60 renewable energy SMEs from the database of the World Bank InfoDev initiative were targeted. A census study of the 60 SMEs in this database was carried out. Primary data was collected using semi-structured questionnaires that were self-administered to the SME owner and senior managers. The collected data was qualitative and quantitative in nature and it was analyzed through descriptive correlation, multiple regression and content analysis. The findings revealed that respondents agreed that marketing support influenced survival of the SMEs due to overall mean score of M = 3.88. The correlation analysis showed that marketing support and survival of SMEs in the renewable energy had positive and significant association (r = 0.569, p = 0.000 <0.05). The regression coefficient showed a positive and noteworthy association between marketing support and survival of SMEs in the renewable energy based on beta findings of (β =2.991, p < 0.05). Results also showed that 59.9% of changes in the survival of the SMEs in the renewable energy sector in Kenya could be traced to marketing support. Thus, the study concluded that survival of SMEs in the renewable energy in Kenya largely depends on accessing and participation in business incubation programs for marketing support. The study also concludes that marketing support contributes to business survival. The study recommends that SME owners should use online marketing to expand their reach to regional and global markets and also advertise and broadcast their products in trade fairs and exhibitions.

Keywords: Marketing support, Market information, Market linkages, market research, Access physical markets, Business survival.

INTRODUCTION

Globally, SMEs contribute a lot in economic growth, employment and driving innovation. In the developed high-income world, they contribute 49% to the Gross Domestic Product while about 67% of all formal employment. In the developing and low-income countries, SMEs contribute 29% to the GDP and provide 45% of all formal employment (International Finance Corporation, 2014). Despite their significant role, the survival of small businesses is threatened and not assured as they are limited in size and resources and do not have the experience of dealing with challenges that occur in the course of starting and operating a business. They lack the key resources, financial, physical, managerial, marketing and administrative capabilities required to successfully run a business. According to Bengtsson and Johansson (2014), SMEs don’t have market presence, key resources and depend on a narrow customer base. They lack money for pursuing business opportunities (Schumann, Scott, Kalinowski, Kaliski & Pragman, 2014). Small business owners face difficulties in protecting their businesses from failure due to lack of enough finance and financial support (Falkner & Hiebl, 2015).

Studies done in the United States revealed that about 20%, 45% and 65% of new businesses fail within two years, five years and 10 years after opening respectively. Just about 25% of them make it beyond 15 years (U.S. BLS, 2020). It is estimated that half of all the
current SMES in the developing world have the likelihood to fail within six years (IEG, 2014). In Nigeria, 80% of SMEs close shop within 5 years of startup (SMEDAN, 2015). The scenario is replicated in Kenya where three out of every five SME businesses in Kenya (60%) close within the first two years of operation (KNBS, 2013). A policy brief on incubation prepared by the OECD/EU (2019) points out that businesses that are supported through incubation have a higher tendency for survival, provide more jobs and have higher revenues.

There has been growth in interest towards business incubation programs to support development of successful SMEs. Incubation provides entrepreneurs with the skills to start, grow and manage a business (ANZABI, 2019). Business incubators are known to be an effective tool for job creation and increasing the survival rate of businesses (Al-Mubarak & Muhammad, 2013). Business incubation programs assist entrepreneurs in the cost of running a start-up venture towards its survival in the first three years of operation (Kowo, Akinbola & Abeokuta, 2018). In Brazil, 80% of incubates survive compared to 50 percent of un-incubated businesses that do not service the first year (InfoDev, 2013). In Kenya, researchers have documented the role played by business incubation in promoting entrepreneurship and found a positive relationship (Omweri, 2016).

The African Development Bank describes incubation as the training of entrepreneurs on business skills and business plan development, mentoring and linking them to markets and finances, provision of better interaction, networking and exchange of innovative ideas amongst entrepreneurs, and dissemination of information on markets and financial services products (AFDB, 2017). Entrepreneurs join incubation in order to gain multiple skills for business and get assistance with a wide range of activities (Lose & Tengeh, 2016). It is achieved through a variety of activities that provide financial and physical services including business mentorship, marketing support, business training, administrative and secretarial services, access to finance, networking, working space, business address, and shared offices and equipment (Afriana, 2018; OECD/EU, 2019). Marketing support comes in the form of creation of synergies with the local business environment so that incubated businesses can access markets. SMEs are also supported with developing effective marketing strategies for their products/services (Lesakova, 2012).

Business survival is a set of entities that keep a company in business five years after it started (Lopez, O’Farrill, Perez & Velasquez, 2017). A firm’s survival is based on performance of its business activities which is critical for its growth and sustainability (Shin, Park, Choi & Choy, 2017). Both financial and non-financial indicators are used by small businesses to measure performance, with profit margins, sales growth, operating income and cash flows most popularly used. These performance indicators help in assessing the chances for survival or failure of business units. This article measures business survival in terms of growth strategy, employee growth, innovation and business lifespan.

SMEs make up the vast majority of firms, and in Kenya they represent about 98% of all businesses (International Trade Centre, 2019). In 2016, Kenya had 1.56 million SMEs with licenses and 5.85 million without, both in the formal and informal sectors, of which, 92% are micro businesses, 7% are small businesses and 1% are medium sized businesses (KNBS, 2016). Despite the important function handled by SMEs towards the social and economic development of Kenya, the sector continues to encounter many limitations that have created obstacles against realizing its full potential and eventually inhibiting SME survival. The SMEs faces constraints such as legal and regulatory framework that is inhibitive, unfavorable policy environment, restricted access to financial services, restricted access to infrastructure (power and water supply) and restricted access to markets. These challenges have led to closure of the SMEs largely due to restricted market access and lack of access to market information. The study will focus on SMEs in the renewable energy, since these enterprises face limited market access due to inflexibility of the energy sector to cater for the market needs of small-scale energy producers thus discouraging them from starting and expanding their investment in renewable energy (Fischer, Lopez, & Suh, 2012).

Statement of the Problem

Despite renewable energy SMEs in Kenya playing a key role for green growth, job creation and bridging the energy gap, 46% of them close shop in less than a year of starting, and another 15% in the second year. The key reasons identified for closure of these businesses include limited market access and market information and limited access to affordable capital, as well as unfavorable government regulations (CBK, 2018). KIPPRA (2018) further indicates that on average, Kenyan startups have an average lifespan of 3.8 years, with 80% of these businesses closing before they get to their 5th year of operation.

In a monitoring and evaluation survey conducted by the Kenya Climate Innovation Center (2016) to collect information on their incubation clients in the renewable energy sector, they found that 69% of their client businesses had been in operation for less than 5 years i.e. 41% were 1-2 years old, 28% were 3-5 years old, 13% were 6-10 years old and 18% were older than 10 years. The findings of this survey further support the reported short life of small businesses in the RE sector and the problem of small business failure.
Thus, the research focused on examining the effect of market support provided in the incubation centres on the survival of small and medium enterprise in the renewable energy sector in Kenya.

Study Objective

i. To examine the effect of marketing support provided in the incubation centres on the survival of SMEs in the renewable energy sector in Kenya.

LITERATURE REVIEW

Theoretical Framework

Market Orientation Theory

Kohli and Jaworski (1990) developed the market orientation theory defining it as broad generation of market intelligence by an organization, and sharing and responding to it across the organization, in order to create value for the customer (Berkowitz, Kerin, Hartley & Rudelius, 2000). It is documented that market orientation came from the theory of marketing (Felcman, 2012), from which several orientations or concepts were developed (Kotler, 2012). Berkowitz, et al. (2000) advanced similar insights which are very close to the holistic marketing concept of Kotler and Keller (2012). From their findings some of the main areas to be included as part of the firm’s marketing action-plan include integrated, internal, relationship and performance marketing.

The main feature of this theory in relation to marketing support given during business incubation is that the theory postulates attaining of the goals of the firm is determined by the needs of its target markets through effective integration of its marketing activities (Kotler, 1999). Komen and Kagiri (2018) used the market orientation theory to explain the adoption of mobile banking in Equity Bank and how it is affected by effects marketing strategies. This theory was also applied by Mwiru (2018) and Tarpeh (2017) in conducting market orientation and environmental scanning practices respectively.

With reference to the current study, the theory is relevant as it acknowledges the role of business incubation in providing marketing information, market research and consumer analysis to SMEs so that they are able understand their customers, competitors and environment. This enables them to effectively market their products, meet their customer needs and deliver superior value for competitive advantage and eventual survival.

Empirical Literature

SMEs face severe marketing challenges when trying to pursue growth and survival including lack of knowledge in marketing their products and insufficient funds for marketing activities. If left to face these challenges alone, SMEs will fail at a high rate and encounter slow growth. Support is therefore provided by governments and donor organizations in accessing finance, markets, capacity building among others (Osei, Shao, Forkuh & Osei, 2016). Marketing support comes in the form of creation of synergies with the local and international business environment so that incubated businesses can access markets. SMEs are also supported with developing effective marketing strategies for their products/services (Lesakova, 2012).

In Kenya access to markets and marketing information has been identified as a major limitation to SME development and competitiveness. These constraints include poor quality products and services, low access to physical markets, limited market research and analysis, poor linkages with export markets and narrow product diversity among others (GOK, 2005, KIPPRA, 2006). This causes SMEs to only trade within saturated local markets thus missing key opportunities in the global markets that are necessary for their survival and expansion, (Kimuru, 2018).

Akwalu (2014) investigated how access to markets affected the performance of youth-owned SMEs in Maara Sub-County, Tharaka-Nithi County. 147 youth owned enterprises were selected using purposive sampling from a study population of 230 youth owned SMEs, and concluded that accessing to markets improved the performance of the youth-owned businesses. There was a relationship between the extents to which the respondents think that the market access influences performance.
Njoroge (2015) conducted a study of 86 SMEs in Matuu town Machakos County, Kenya establishing a positive association that marketing strategies had with the performance of SMEs. The study differs from the current study as it looks at the effect of marketing from the perspective of strategies while the current study looked at its effect from the perspective of marketing support provided during incubation.

Osei, Shao, Forkuoh and Osei (2016) assessed a marketing support on a selected group of retail SMEs in Ghana. The aspects of marketing looked at included training and access to global markets and marketing services such as trade fairs and exhibitions. 500 entrepreneurs were selected using purposive sampling and carried out the research using quantitative and qualitative research design. They found that the highest positive impact to SME growth was realized from participation in trade shows and exhibitions. Access to international markets and training came second and third respectively.

Kimuru (2018) looked at youth owned small businesses in Kenya employing a descriptive research design on 127 SMEs that were randomly selected The study found that access to markets was part of key factors and reasons for growth of the SMEs. The research used growth as its dependent variable while the current study used survival.

Conceptual Framework

<table>
<thead>
<tr>
<th>Marketing support</th>
<th>Business survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Access to market information</td>
<td>• Growth strategy</td>
</tr>
<tr>
<td>• Access to physical markets</td>
<td>• Employee growth</td>
</tr>
<tr>
<td>• Market linkages</td>
<td>• Innovation</td>
</tr>
<tr>
<td>• Marketing research</td>
<td>• Business lifespan</td>
</tr>
</tbody>
</table>

Independent Variable | Dependent Variable

RESEARCH METHODOLOGY

Research Design

The study employed the use of the descriptive research design that entailed gathering of data that is illustrative of the events under study, and then arranging the data into tabulations, depictions and descriptions (Yuko & Onen, 2011). The descriptive research design became appropriate, since this study was determined to examine how marketing support provided in the business incubation centers affected the survival of SMEs, by seeking to acquire knowledge on the past and current status.

Target Population, Sampling Technique and Sample Size

60 incubated renewable energy SMEs in Kenya drawn from the database of the World Bank-InfoDev initiative (World Bank, 2020) was the target population in the current study. The unit of observation consisted of all the 60 business owners of these RE businesses. The study used census method since there are only 60 incubated renewable energy SMEs in the database of the World Bank InfoDev initiative, allowing all of them to be considered in the study.

Data Collection Instrument, Procedure and Analysis
The study collected both primary and secondary data. Semi-structured questionnaires were used for collecting primary data and secondary data was collected from official company information and was gathered from company reports, company strategies and publications from incubation centers. A pilot test was conducted using 6 owners of renewable energy SMEs and results showed the questionnaire was valid and reliable based on Cronbach Alpha overall score of .803. The questionnaires were self-administered through physical distribution, private electronic means i.e. emails and followed up through telephone calls. The collected data was treated using content analysis that uses meanings and implications from respondents and documented data was used to analyze data from the open-ended questions. The collected quantitative data from the closed-ended questions were analyzed using the SPSS and MS Excel. Means, standard deviations, percentages and frequency distributions were obtained and the information was presented in the form of charts, graphs and tables. The effect of each independent variable on the dependent variable was established by conducting correlation and regression analysis. The following equation indicates the multi-linear model of regression that was used in this study:

\[ Y = \beta_0 + \beta_1 X_1 + \epsilon \]

**FINDINGS AND DISCUSSIONS**

**Descriptive Analysis**

The researcher conducted descriptive analysis to get means and standard deviation on the responses on each of the statement. The analysis was done on Likert scale where 1= not at all   2= strongly disagree   3=disagree   4=agree 5=strongly agree

| Table 1: Marketing Support |
|---------------------------------|---------|---------|
| Statement                                                   | Mean    | Std. Dev. |
| Because of the support, we are now aware of the opportunities in trading in Kenya | 4.068   | 0.997    |
| Because of the support, we were able to develop a marketing strategy for our business | 3.795   | 0.904    |
| The support provided opportunities to showcase my products/services in trade fairs and exhibitions | 3.977   | 0.976    |
| The programme gave our business access to market information | 3.931   | 0.949    |
| The programme gave our business access to physical markets | 3.84    | 1.055    |
| The programme gave our business links to international markets | 3.704   | 1.047    |
| The programme enabled us to conduct market surveys | 3.864   | 1.025    |
| The programme enabled us to conduct competitor analysis | 3.863   | 1.091    |
| Overall score                                                 | 3.880   | 1.005    |

Tables 1 contains the results of the questions related to the variables (mean = 3.880, std dev = 1.005) showing that the study respondents had agreed that marketing support had helped their enterprises to survive for longer. The findings echo what Akwalu (2014) found that accessing the markets influences the performance of youth-owned SMEs. Osei, et al. (2016) revealed that trainings, access to global markets and other marketing services like exhibitions and trade fairs improves SME growth, and that marketing services helped the growth of retail SMEs through accessing information and participating in trade fairs and exhibitions. Kimuru (2018) argues that Kenyan SMEs inability to access export markets, inaccessibility to physical markets and even global markets hamper their quest for survival and expansion. Njoroge (2015) shared that the presence of marketing strategies through marketing support from incubations improved performance of SMEs.

**Correlation Analysis**

| Table 2: Correlation Analysis |
|-------------------------------|---------|---------|
| Survival of SMEs             | Pearson Correlation | Survival of SMEs | Marketing Support |
| Sig. (2-tailed)               | 1       | 1       |
The results also show that marketing support had strong and positive affiliations to survival of the SMEs as based on these results ($r = 0.569$ and $p = 0.000 < 0.05$).

### Regression Analysis

#### Table 3: Model Summary

<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>.647*</td>
<td>.465</td>
<td>.599</td>
<td>1.69454</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Marketing Support

Table 3 means that 59.9% of changes in the survival of the SMEs in the renewable energy sector in Kenya can be attributed to marketing support. The results also indicate presence of a residual effect of 40.1% of elements that lead to survival of SMEs that are outside the scope of the current study.

#### Table 4: ANOVA

<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>1</td>
<td>Regression</td>
<td>215.017</td>
<td>1</td>
<td>215.017</td>
<td>36.143</td>
</tr>
<tr>
<td></td>
<td>Residual</td>
<td>249.846</td>
<td>42</td>
<td>5.949</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>464.863</td>
<td>43</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Survival of SMEs
b. Predictors: (Constant), Marketing Support

The ANOVA test was done at a significance level of 0.05 and the $F_{\text{calculated}}$ is found to be 36.143 which is greater than the $F_{\text{critical}}$ found to be 4.073 such that $(7.745 > 4.073)$ an indication that the model is ideal and can be used in the current study.

#### Table 5: Regression Coefficient

<table>
<thead>
<tr>
<th>Model</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>14.981</td>
<td>1.327</td>
</tr>
<tr>
<td>Marketing Support</td>
<td>2.991</td>
<td>.858</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Survival of SMEs

Table 5 shows that marketing support had positive and noteworthy association with survival of SMEs based on ($\beta = 2.991$, $p < 0.05$). Similarly, Akwalu (2014) who found that accessing of markets by enterprises is linked to performance of youth-owned business SMEs. Furthermore, Njoroge (2015) found positive relations that marketing strategies had on performance of SMEs.
The research sought to find out what influence marketing support has on survival of SMEs in the renewable energy sector in Kenya. The study participants showed that marketing support provided during business incubation made them aware of trading opportunities that they could explore and improve their chances of survival. The study participants strongly agreed that showcasing their products in trade fairs, accessing marketing information on both physical and online markets as well as local and international markets expanded the places to market and sell their products, improving their sales earnings and thus survival rates. Furthermore, with knowledge on how to conduct market surveys and competitor analysis, product positioning became easier leading to more sales and continuity in operations.

CONCLUSIONS AND RECOMMENDATIONS

The study findings indicate that marketing support contributes to business survival. It can thus be concluded that when business owners and entrepreneurs get access to market information, physical and international markets, it contributes significantly to their survival as showcasing their products and services in trade fairs and exhibitions helps them to gain more sales and sustain their operations.

The study recommends that the SME owners and managers seek means of broadcasting their products in different markets. They should be engaged in trade fairs, exhibitions and set strategies to expand their market reach through online marketing, and expanding to regional and global markets. The study also suggests that managers learn different marketing strategies that they can implement.

REFERENCES


Lesakova, L. (2012). The Role of Business Incubators in Supporting the SME Start-up. Slovak: Matej Bel University


